THE LAND REMOTE-SENSING COMMERCIALIZATION ACT OF 1984—H.R. 4836 AND H.R. 5155

HEARING

BEFORE THE

SUBCOMMITTEE ON NATURAL RESOURCES,
AGRICULTURE RESEARCH AND ENVIRONMENT

AND THE

SUBCOMMITTEE ON
SPACE SCIENCE AND APPLICATIONS

OF THE

COMMITTEE ON
SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

NINETY-EIGHTH CONGRESS

SECOND SESSION

MARCH 6, 1984

[No. 74]

Printed for the use of the
Committee on Science and Technology

U.S. GOVERNMENT PRINTING OFFICE
33-947 O WASHINGTON : 1984

H701-51

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LETTER OF TRANSMITTAL

Hon. Don Fuqua,
Chairman, Committee on Science and Technology,
House of Representatives, Washington, D.C.

Dear Mr. Chairman: We are transmitting herewith the record of hearings entitled, "The Land Remote-Sensing Commercialization Act of 1984—H.R. 4836 and H.R. 5155," which were held on March 6, 1984.

The subject of the legislation has been thoroughly explored in our Committee, going back through hearings held in 1977, 1979, 1980, and 1981. We particularly want to mention our more recent efforts because they have focused on specific commercialization activities which have culminated in the legislation now before us.

In June 1983, the Committee published a report entitled, "Commercialization of Land and Weather Satellites" (Serial H of the 98th Congress) which contains much useful background information. Also in 1983, our Subcommittees have held joint hearings on April 14, June 21 and 28, July 14 and 21, and November 8 and 9. These have been published by the Committee under the title, "The Commercialization of Meteorological and Land Remote-Sensing Satellites" (No. 53, 98th Congress).

The November 8 and 9 hearings were focused on a draft bill which was modified to become H.R. 4836, the bill before the two Subcommittees at the present hearing. That bill was subsequently modified by several perfecting, clarifying and technical amendments and reintroduced as H.R. 5155, which subsequently (on April 9, 1984) passed the House without further amendment. House Report 98-647 accompanied H.R. 5155.

We hope that this letter helps to clarify the legislative history. Mr. Chairman, we commend this record to you and to other Members.

Sincerely,

James H. Scheuer,
Chairman, Subcommittee on Natural Resources,
Agriculture Research and Environment.

Harold L. Volkmer,
Chairman, Subcommittee on Space Science
and Applications.

THE LAND REMOTE-SENSING COMMERCIALIZATION ACT OF 1984—H.R. 4836 AND H.R. 5155

TUESDAY, MARCH 6, 1984

House of Representatives, Committee on Science and Technology, Subcommittee on Natural Resources, Agriculture Research and Environment, and Subcommittee on Space Science and Applications,
Washington, D.C.

The subcommittees met, pursuant to notice, at 9:30 a.m., in room 2325, Rayburn House Office Building, Hon. Harold L. Volkmer (chairman of the subcommittee) presiding.

Present: Representatives Volkmer, Brown, Bateman, Schneider.

Mr. Volkmer. The Subcommittee on Space Science and Applications will come to order.

Today, the Subcommittees on Space Science and Applications and Natural Resources, Agriculture Research and Environment, will jointly take testimony on H.R. 4836, the Land Remote-Sensing Commercialization Act of 1984.

This bill is intended to set policies, procedures, conditions, and limitations on the commercialization of land remote-sensing as foreseen by the Bateman amendment to title II of Public Law 98-52.

Our only witness today is Dr. William P. Bishop, Chairman of the Source Evaluation Board on Civil Space Remote Sensing. Under Dr. Bishop's leadership, the SEB is carrying out a process which seems to conform rather closely to the bill we have before us today.

While we have only one witness today, any others wishing to comment on our bill are encouraged to do so. Written statements may be submitted to me or to Chairman Scheuer for consideration for inclusion in the hearing record.

The bill before us today is in many ways the culmination of years of activity on the part of the committee and, of course, NASA and NOAA. Landsat 1 was launched by NASA in 1972. The subcommittee has had hearings on space remote-sensing in 1977, 1979, 1980, 1981, and 1983. There are parallel efforts in the Senate.

In 1980, NOAA was given responsibility for managing the operational civil remote-sensing satellites. Almost exactly a year ago, on March 8, 1983, President Reagan announced his decision to commercialize land and weather sensing satellites.

Along the way, however, the idea of commercializing weather satellites was dropped, in large part due to efforts led by our colleague, the gentleman from Texas, Mr. Andrews.

Clearly, the Congress has not lightly considered this issue. Although most of us strongly support commercialization, we also believe that space programs should be operated for the benefit of all mankind. There are many public good aspects to remote sensing that must be maintained. This is one reason that the weather satellites were dropped from consideration for commercialization.

In H.R. 4836, we have tried to strike a balance. We are trying to preserve the elements of public good while at the same time encouraging entrepreneurial development and application of this technology.

We feel that many of the broad public benefits will be preserved through our insistence on a strict policy of nondiscriminatory data availability. It is interesting that this same nondiscriminatory policy will also protect and stimulate the highly entrepreneurial value added industry. The value-added firms will undoubtedly play a large role in stimulating the market for remote sensing technology.

I also want to note that the Office of Technology Assessment is today releasing a report entitled, "Remote Sensing and the Private Sector," which they have prepared for our committee. Copies are available at the press table. When those are gone, then you can obtain one from the Office of Technology Assessment.

Also, the General Accounting Office has also just released a report on the same general subject entitled, "Effects on Users of Commercializing Landsat and Weather Satellites." Both of these reports point out some adverse effects that could occur if remote sensing were commercialized without adequate protection of national security and foreign policy concerns. I believe that H.R. 4836 has such adequate protections.

Finally, I want to point out for the record that the record of our 1983 hearings which has just been published and is now available. Copies of that are also available at the press table.

In conclusion, I believe we have listened to many points of view and arrived at a balanced, consensus view. The bill before us may need perfecting amendments, but the preponderance of testimony and comment we have received suggests that it is basically sound—I am not saying that it is perfect—and we welcome any constructive criticism.

We look forward to hearing whether the administration agrees with the bill and if not, what areas that they have a concern with.

[H.R. 4836 is reproduced in the appendix, together with H.R. 5155 which was developed from H.R. 4836.]

[The opening statement of Mr. Scheuer follows:]

Thank you, Mr. Chairman.

I join with you in welcoming Dr. Bill Bishop today and in commending him and his entire Source Evaluation Board for the fine work that they have done both with respect to the request-for-proposals (RFP) and with respect to cooperation with this committee.

I must say that the current level of cooperation between the Congress and the administration on this issue is remarkable in light of the intractable impasse which existed not one year ago. We have come a long way since then, largely, I think, because of the consensus that it is timely and in the public interest to begin the orderly transition toward commercial operation of civil remote-sensing from space. The bill before us today constitutes a sound approach to establishing a market-based commercial system, without compromising our national security and international interests. I have been greatly encouraged that over the past several months that the

Administration, under the leadership of Dr. Bishop, has modified its policies to the point that they are nearly aligned with the policies embodied in our legislation. This movement by the administration has been a very positive step, signaling to me that we will reach agreement on this issue quickly. Consensus is absolutely essential if the United States is to avoid handing over to foreign competitors another technology that is ripe for commercialization.

Thank you, Mr. Chairman.

Mr. VOLKMER. Dr. Bishop, I want to welcome you here this morning. Your statement, which you have been so kind as to furnish us copies of, at this time will be made a part of the record. You may either review it in full or summarize, however you so desire.

STATEMENT OF WILLIAM P. BISHOP, CHAIRMAN, SOURCE EVALUATION BOARD FOR CIVIL SPACE REMOTE SENSING, U.S. DEPARTMENT OF COMMERCE

Mr. BISHOP. Thank you, Mr. Chairman. I am actually quite delighted to be here today and I will take the opportunity to just let my prepared statement stand in the record and summarize it briefly, and hit some of the high points.

You correctly pointed out the history of commercialization, which has been rather lengthy. Two events that I would like to add to your list for the record are that we had a bidder's conference which occurred on January 10 in which there was considerable interest in this. Some 25 firms sent some 95 people to hear any last-minute things that the Source Evaluation Board might have to say. We know that a number of these firms are now busy, even as we speak here today, preparing their bids against our RFP.

The final note for the record is that those bids are due on March 19, just some 13 days from today.

As you pointed out, legislation is needed for us to continue with the commercialization effort, and I think H.R. 4836 demonstrates that there is a substantial sharing of goals between Congress and the administration on how to go about this. As you correctly pointed out, they are quite concurrent.

You will find in my prepared testimony I largely dwell on a number of items which are of concern to the administration. Before I touch on some highlights of those, I might add that by omission there are a great number of things about the bill that we like a great deal. Let me, just for the record, list a few of those.

We like the statement of goals and findings in the front end, find them quite consistent with the goals that we have set out for ourselves in the RFP process.

We like the separation of title II and title III into distinct periods—something we also did in the RFP.

We appreciate the sense of urgency that the bill expresses. We have expressed that same sense of urgency to any potential bidders on our RFP, making it quite clear to them that anything they can do to move rapidly will be weighed heavily in our consideration.

Your focus on national security and international concerns is something that is a first test that any bid must pass under our process.

Your selection criteria are quite similar to those stated in the RFP and the ones that the Board is using.

Your expression of interest in the company having ownership of the data is something that we specified in the RFP, and there is a minor comment in my prepared remarks about that, where we think the language could be strengthened slightly.

We too use the multispectral scanner as our base line, saying that we would not be interested in having a bid that had technology of lesser capability than that and, as with your bill, we in the RFP said that we expected some initial Government support to start this commercialization process.

I remark in the prepared testimony that it is important that the bill and the RFP be consistent. We have gone through a fairly lengthy and complicated process in preparing an RFP and a number of firms are working very hard to respond to that directly.

I am fairly confident, having studied the bill, that there are no differences between the RFP and the bill that would be of such a nature as to cause us to have to reverse ourselves and go back and start over again.

Let me point out a few of the things that are in the prepared testimony which are areas of concern to the administration.

One is in title II of the bill, which is for marketing the data from the Government's Landsat system. The Secretary is required to seek a contract with a private firm to do the marketing of the data.

In the RFP we have focused more on the follow-on commercial system (which is our ultimate goal) and made it optional for the bidders as to whether they wish to take on a role during the lifetime of the Government's Landsat system. We would prefer that the language in the bill also gave to the Secretary discretion in that regard.

The second thing I would note is the period of the contract, the length of the contract, specified in title III, that is 6 years. We established in the RFP a period of 12 years which sounds radically different from the 6. But it is not quite as different as it might seem, because our clocks start at two different times in the process.

Our rationale was that there would probably be a couple of years of useful life of the Government's System after a contract could be signed, that it would take a period of time for the new contractor to build and fly his own system, and that he should have a period of time after that, while the system was operating, to build his self-sustaining commercial system.

When we added all those up and gave a little bit of extra slack, our number came to 12 years. Using the same calculus, your number would come closer to 8 than 6 in the number of years.

We would actually prefer to leave it open in the language of the legislation. But our difference is not very large there, as I said.

The third point—which is actually a set of points—that we make in the prepared testimony is that we have in the RFP gone to great length to provide financial flexibility to the potential bidders, whereas your bill has some points which are more restrictive than the RFP. They are probably not such that would cause us to have to start our process over again, but let me just list them briefly.

Your bill specifies that we may not agree to a guaranteed data purchase. That could, in fact, be an attractive feature of a bid.

Your bill also has us pay part of the capital costs at the outset. We have also in the RFP suggested such things as loans and loan guarantees, and other financial mechanisms that might be attractive to the Government and/or the bidders.

Two others. You call in several places for a royalty or a rebate to the Government on data that is sold to the Government. This, too, is something that we feel should be allowed but not necessarily required. Flexibility is in our best interest.

Finally, you call in section 6 of the bill, for reimbursement to the Government for services rendered. This, too, is a place where some flexibility for the Secretary to devise with the bidders the best financial deal for the Government could be provided by loosening the requirements of the bill.

In short, on the financial side we have left in the RFP the arrangements quite wide open so that the bidders can come in with what we would hope would be an innovative arrangement with the Government that would be in our best interest.

You mentioned the subject of nondiscriminatory data access. I feel that I must also say something about that because that is one of the places where the bill and the RFP differ slightly.

The bill, as you say, requires that this new contractor sell the data on a nondiscriminatory basis. Our RFP requires him to as close as commercially possible match the current Government practices but leaves the door open for him to do some innovation in that regard.

One final point I would make, and then perhaps respond to your questions, is that in section 6 of your bill, the roles of the Secretary of Defense and the Secretary of State become in one question subsidiary to the role of the Secretary of Commerce. We think that language should be changed such that their roles are in no way diminished by having to report through the Secretary of Commerce.

In conclusion—although I have just recited a number of things, and my testimony does recite a number of things, where we feel the bill could be strengthened—I would really like to congratulate the subcommittees and their staffs for what we believe is a very fine bill. You will find that both in the opening and the closing parts of my remarks, the written remarks.

With that, I would be delighted to answer any questions.

[The prepared statement of Mr. Bishop follows:]

STATEMENT OF

WILLIAM P. BISHOP

CHAIRMAN, SOURCE EVALUATION BOARD

FOR CIVIL SPACE REMOTE SENSING

BEFORE THE

SUBCOMMITTEE ON NATURAL RESOURCES, AGRICULTURE

RESEARCH AND ENVIRONMENT

AND THE

SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS

COMMITTEE ON SCIENCE AND TECHNOLOGY

U.S. HOUSE OF REPRESENTATIVES

MARCH 6, 1984

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEES:

MY NAME IS WILLIAM P. BISHOP. I AM THE CHAIRMAN OF THE DEPARTMENT OF COMMERCE'S SOURCE EVALUATION BOARD ON CIVIL SPACE REMOTE SENSING (THE "SEB"). I AM PLEASED TO BE HERE TODAY TO TESTIFY ON BEHALF OF THE ADMINISTRATION CONCERNING H.R. 4836, "THE LAND REMOTE SENSING COMMERCIALIZATION ACT OF 1984."

SINCE SECRETARY BALDRIGE AND MY PREDECESSOR, RAY KAMMER, HAVE TESTIFIED TO YOU ON SEVERAL OCCASIONS CONCERNING THE COMMERCIALIZATION OF CIVIL LAND REMOTE SENSING, I WILL NOT DWELL ON THE ACTIVITIES OF THE SEB DURING THE PAST SEVERAL MONTHS, EXCEPT TO SAY THE RFP FOR THE COMMERCIALIZATION OF LAND REMOTE SENSING WAS RELEASED ON JANUARY 3, 1984, AND RESPONSES ARE DUE BY NOON, MARCH 19, 1984. TODAY I WOULD LIKE TO FOCUS MY COMMENTS SPECIFICALLY ON H.R. 4836.

FIRST, MR. CHAIRMAN, LET ME THANK THE COMMITTEES FOR THEIR LEADERSHIP REGARDING THIS ISSUE. THE COMMITTEES HAVE, IN H.R. 4836, DEVELOPED A PRACTICAL APPROACH TO COMMERCIALIZATION. WE ESPECIALLY APPRECIATE HAVING HAD THE OPPORTUNITY TO WORK CLOSELY WITH YOUR STAFFS ON THIS MATTER, AND WE BELIEVE THAT IN H.R. 4836, A SOLID START HAS BEEN MADE.

IT IS THE DESIRE OF THE ADMINISTRATION TO ACHIEVE COMMERCIALIZATION OF CIVIL LAND REMOTE SENSING FROM SPACE AS SOON AS POSSIBLE, WHILE MAINTAINING THE U.S. LEAD IN LAND REMOTE SENSING, AND HAVING THE PRIVATE SECTOR MAKE THE MAJOR INVESTMENT. H.R. 4836, WITH SOME TECHNICAL CHANGES WHICH I WILL DISCUSS IN A MOMENT, IS AN APPROPRIATE FRAMEWORK FOR DISCUSSION OF HOW THESE GOALS MAY BE ACHIEVED.

MR. CHAIRMAN, OUR COMMENTS ON H.R. 4836 REFLECT IN LARGE PART THE EXPERIENCE OF THE ADMINISTRATION IN CONDUCTING THE RFP PROCESS OVER THE LAST SEVERAL MONTHS. ONE OF THE LESSONS WE HAVE LEARNED IN THIS PROCESS IS: WE DON'T WANT TO HAVE TO DO IT AGAIN -- AT LEAST RIGHT AWAY. IT IS THEREFORE OF EXTREME IMPORTANCE THAT LEGISLATION ENACTED BY THE CONGRESS AND THE RFP PREPARED BY THE SEB BE CONSISTENT ON THE SUBSTANTIVE ISSUES. WITH SOME MINOR EXCEPTIONS, I BELIEVE THEY ARE CONSISTENT.

THE PROCUREMENT PROCESS NOW UNDER WAY CONSTITUTES WHAT WE BELIEVE TO BE THE MOST THOROUGH AND EXHAUSTIVE EFFORT TO DATE TO DETERMINE THE "NEXT STEPS" IN THE LANDSAT PROGRAM THAT MOST FACILITATE THE TRANSFER OF LAND REMOTE SENSING OPERATIONS TO THE PRIVATE SECTOR. IT HAS ALSO BEEN AN UNUSUALLY COMPLICATED AND TIME-CONSUMING PROCUREMENT ACTION. EVEN AS WE DISCUSS THIS SUBJECT TODAY, A NUMBER OF FIRMS ARE

EXPENDING CONSIDERABLE TIME AND CORPORATE FUNDS PREPARING RESPONSES TO THE RFP. IN OUR VIEW, IT WOULD BE EXTREMELY UNFORTUNATE IF THE WORK OF THE SEB AND THESE PRIVATE FIRMS WERE TO BE DISCARDED OR REPEATED. IT CERTAINLY WOULD RESULT IN SIGNIFICANT AND COSTLY DELAYS IN THE COMMERCIALIZATION PROCESS, A RESULT WE BELIEVE WOULD BE UNFORTUNATE.

I AM PLEASED, THEREFORE, THAT WE HAVE ONLY SOME MINOR CHANGES TO SUGGEST TO AN OTHERWISE EXCELLENT BILL.

WITH THESE OVERALL THOUGHTS IN MIND, MR. CHAIRMAN, I WOULD LIKE TO OFFER THE FOLLOWING SPECIFIC COMMENTS ON H.R. 4836, WHICH ARE GROUPED AROUND PRINCIPAL ISSUES RAISED BY THE BILL. I UNDERSTAND THAT OTHER EXECUTIVE BRANCH AGENCIES MAY HAVE CONCERNS ABOUT ADDITIONAL ISSUES WHICH THEY MAY BRING TO THE ATTENTION OF THE COMMITTEES.

IN ADDITION TO THESE VIEWS, WE ARE PREPARING A NUMBER OF TECHNICAL COMMENTS AS WELL AS SPECIFIC LANGUAGE FOR YOUR CONSIDERATION WHICH IMPLEMENTS THE SUGGESTIONS THAT FOLLOW. WE HOPE TO MAKE THESE AVAILABLE TO THE COMMITTEES IN THE VERY NEAR FUTURE.

SCOPE OF THE BILL

FIRST, A WORD CONCERNING THE SCOPE OF THE BILL. THE SHORT TITLE AND FINDINGS REFER TO "LAND REMOTE SENSING", WHILE THE OPERATIVE PORTIONS OF THE BILL APPARENTLY REFER TO BOTH LAND AND OCEAN REMOTE SENSING.

THERE IS NO GENERALLY RECOGNIZED OPERATIONAL CAPABILITY IN OCEAN REMOTE SENSING AT THE PRESENT TIME. INCLUDING OCEAN SENSING WITHIN THE SCOPE OF THE BILL WILL HAVE THE EFFECT OF SPECIFYING THE GOVERNMENT'S CONDITIONS FOR THE COMMERCIALIZATION OF OCEAN REMOTE SENSING LONG BEFORE THE PARAMETERS OF SUCH A SYSTEM - OR THE NEED FOR COMMERCIALIZATION - HAVE BEEN ESTABLISHED. THIS MAY HAVE THE EFFECT OF INHIBITING INNOVATION IN THIS AREA. IT IS THE VIEW OF THE ADMINISTRATION THAT THE BILL'S APPLICATION SHOULD THEREFORE BE LIMITED TO LAND REMOTE SENSING.

COMPATIBILITY WITH THE RFP

MR. CHAIRMAN, ONE OF OUR PRINCIPAL CONCERNS, AS I INDICATED ABOVE, IS THAT THE BILL DO NOTHING THAT WOULD CAUSE US TO BEGIN AGAIN, OR SERIOUSLY DELAY, THE ONGOING RFP PROCESS. SEVERAL OF THE PROVISIONS IN THE BILL COULD HAVE THIS RESULT, SINCE THEY ARE MORE RESTRICTIVE THAN THE RFP. I WOULD LIKE TO DISCUSS THESE FOR A MOMENT IF I MAY.

REQUIRED MARKETING. SECTION 201(A) OF THE BILL WOULD REQUIRE THE SECRETARY TO CONTRACT FOR THE MARKETING OF DATA GENERATED BY THE CURRENT LANDSAT SYSTEM. WE ARE CERTAINLY NOT OPPOSED IN PRINCIPLE TO THE CONCEPT OF PRIVATE-SECTOR MARKETING OF LANDSAT DATA, AND WE ENCOURAGE A BIDDER TO TAKE OVER THE LANDSAT SYSTEM. BUT THERE IS NO REQUIREMENT IN THE RFP THAT A BIDDER DO SO. THUS, IF THE SUCCESSFUL BIDDER IN THE RFP PROCESS DOES NOT UNDERTAKE TO MARKET THE DATA, AN ADDITIONAL PROCUREMENT ACTION WOULD BE REQUIRED FOR THE MARKETING COMPONENT. NOT ONLY WILL THIS PROCUREMENT BE TIME-CONSUMING AND BURDENSOME, BUT IN OUR VIEW, IT WOULD NOT PRODUCE RESULTS COMMENSURATE WITH COST.

BY THE TIME A SECOND PROCUREMENT ACTION WERE COMPLETED, THERE WOULD PROBABLY BE NOT BE MORE THAN 18 TO 24 MONTHS OF USEFUL LIFE REMAINING IN THE LANDSAT SYSTEM. ANY ACTIVITIES UNDERTAKEN BY A MARKETER ON BEHALF OF THE GOVERNMENT DURING THAT PERIOD WOULD ALMOST CERTAINLY NOT PRODUCE RESULTS JUSTIFYING THE PROCUREMENT EFFORT.

WE WOULD THUS LIKE TO SEE THE LANGUAGE REGARDING THE MARKETING OF LANDSAT DATA BE AMENDED TO GRANT THE SECRETARY DISCRETION IN WHETHER OR NOT TO CONTRACT FOR THE DATA MARKETING FUNCTION.

TERM OF THE TITLE III CONTRACT. SECTION 302 OF THE BILL PROVIDES THAT THE CONTRACT ENTERED INTO BY THE SECRETARY UNDER TITLE III SHALL REASONABLY ASSURE THE PROVISION OF REMOTE SENSING DATA FOR A PERIOD OF SIX YEARS, TERMINATING ONE YEAR AFTER THE EXPIRATION OF THIS SIX-YEAR PERIOD. WHILE THE LENGTH OF THE CONTRACT WILL DEPEND ON A NUMBER OF TERMS AND CONDITIONS, IT IS OUR OPINION THAT THE SIX-YEAR PERIOD CONTEMPLATED BY THE BILL MAY BE OVERLY RESTRICTIVE.

IT IS DIFFICULT TO SPECIFY OR RECOMMEND A MORE APPROPRIATE PERIOD OF TIME PRIOR TO RECEIPT AND ANALYSIS OF ALL THE RESPONSES TO THE RFP. HOWEVER, OUR PRELIMINARY FINANCIAL MODELING INDICATES THAT A MORE LIKELY PERIOD FOR SUCCESSFUL CONVERSION TO FULL COMMERCIAL OPERATION WOULD BE APPROXIMATELY EIGHT YEARS RATHER THAN SIX. FURTHER, THE EIGHT-YEAR PERIOD WOULD NOT INCLUDE THE TIME PRIOR TO THE LAUNCH OF THE FIRST COMMERCIAL SATELLITE, WHICH IS LIKELY TO BE TWO TO FOUR YEARS.

THE RFP SETS A CONTRACT PERIOD OF NOT MORE THAN TWELVE YEARS. THE TWELVE-YEAR PERIOD WOULD START WITH THE INITIAL PHASE OF SATELLITE CONSTRUCTION -- NOT WITH THE LAUNCH OF THE FIRST SATELLITE. THUS, WHILE THE TERM OF THE CONTRACT DESCRIBED IN TITLE III SHOULD BE NEGOTIABLE

RATHER THAN BEING SET FOR A PRESCRIBED PERIOD OF TIME, THE TERM IS LIKELY TO BE EIGHT YEARS RATHER THAN SIX.

- TITLE TO LANDSAT DATA. SECTION 202(A) OF THE BILL PROVIDES THAT THE TITLE TO ANY AND ALL DATA GENERATED BY THE LANDSAT SYSTEM SHALL REMAIN WITH THE GOVERNMENT, WHILE PROVIDING THAT THE TITLE II CONTRACTOR BE ENTITLED TO REVENUES FROM THE SALE OF COPIES OF DATA FROM THE SYSTEM.

THIS APPROACH VARIES SOMEWHAT FROM THAT ADOPTED BY THE SEB. THE RFP OFFERS BIDDERS THE OPPORTUNITY TO BID ON THE ENTIRE CURRENT LANDSAT SYSTEM, INCLUDING BOTH THE SPACE AND GROUND SEGMENTS. IF A BIDDER WERE TO PROPOSE TAKING OVER THE OWNERSHIP AND OPERATION OF THE SYSTEM, ACCEPTANCE OF HIS PROPOSAL WOULD APPARENTLY BE PROHIBITED BY THE LEGISLATION AS CURRENTLY DRAFTED.

AS A TECHNICAL MATTER, WE ALSO BELIEVE THAT RETENTION BY THE GOVERNMENT OF TITLE TO THE DATA WOULD REQUIRE A PROVISION IN THE BILL PERMITTING THE GOVERNMENT TO COPYRIGHT THE DATA AND LICENSE ITS REPRODUCTION AND SALE BY THE CONTRACTOR. THE RFP AVOIDS THIS REQUIREMENT BY PERMITTING TRANSFER OF TITLE AS WELL AS ASSETS OF THE LANDSAT SYSTEM TO THE PRIVATE SECTOR OPERATOR, IF THIS IS DETERMINED TO BE IN THE NATIONAL INTEREST.

FINANCIAL FLEXIBILITY

MR. CHAIRMAN, IN DRAFTING THE RFP, THE SEB ATTEMPTED TO PROVIDE POTENTIAL BIDDERS WITH THE MAXIMUM POSSIBLE LATITUDE IN STRUCTURING THEIR FINANCIAL PROPOSALS. WE FELT THAT THIS WOULD PERMIT GREATER DIVERSITY AMONG THE PROPOSALS, AND ENCOURAGE CREATIVITY ON THE PART OF THE BIDDERS.

WHILE H.R. 4836 ALSO AFFORDS SUBSTANTIAL LATITUDE TO THE TITLE III CONTRACTOR, IT ALSO CONTAINS RESTRICTIONS WHICH IN CERTAIN CASES ARE INCONSISTENT WITH THE RFP, AND IN ANY EVENT ARE NEITHER NECESSARY NOR ADVISABLE IN OUR VIEW. I WOULD LIKE TO DISCUSS THESE BRIEFLY FOR A MOMENT IF I MAY.

CAPITALIZATION COSTS. FIRST, SECTION 302(B)(4) OF THE BILL PROVIDES THAT THE CONTRACT ENTERED INTO BY THE SECRETARY UNDER TITLE III OF THE BILL MAY PROVIDE FOR A PAYMENT BY THE SECRETARY TO COVER A PORTION OF THE CAPITAL COST IN PROVIDING REMOTE SENSING CAPABILITY. THIS PAYMENT MAY ALSO BE MADE IN INSTALLMENTS BASED ON PROGRESS OVER THE LIFE OF THE CONTRACT.

WHILE THE ADMINISTRATION HAS NO DOUBT THAT THERE MAY BE COSTS ASSOCIATED WITH DEVELOPING THE CAPABILITY REQUIRED BY THE TITLE III CONTRACT, WE ARE NOT PERSUADED THAT A CAPITAL PAYMENT (OR PAYMENTS, AS THE CASE MAY BE) IS THE

ONLY ACCEPTABLE FINANCIAL ARRANGEMENT. AGAIN, WE SIMPLY WISH TO ALLOW BIDDERS THE MAXIMUM LATITUDE IN DEVELOPING THEIR PROPOSALS. IT MAY BE THAT OTHER FINANCIAL VEHICLES, SUCH AS LOANS OR LOAN GUARANTEES, MAY BE PROPOSED. IF SO, WE WOULD LIKE TO BE ABLE TO CONSIDER THEM. AGAIN, HOWEVER, WE WILL BE MAKING AN AWARD TO THAT BID WHICH CONSTITUTES THE BEST DEAL FOR THE TAXPAYER.

- GUARANTEED DATA PURCHASES. SECTION 302(B)(6) OF THE BILL PROHIBITS GUARANTEED DATA PURCHASES BY THE FEDERAL GOVERNMENT. NOW, THE RFP HAS MADE IT CLEAR THAT THE GOVERNMENT WILL NOT ENTER INTO AN EXCLUSIVE DATA PURCHASE ARRANGEMENT. WE HAVE ALSO MADE IT CLEAR THAT THE GOVERNMENT WOULD NOT NECESSARILY AGREE TO A PROPOSAL REQUIRING GUARANTEED PURCHASES.

  FLEXIBILITY WORKS TO OUR ADVANTAGE. SO WE BELIEVE THIS RESTRICTION IS NOT IN THE INTERESTS OF THE GOVERNMENT.

- REBATES. FINALLY, SECTION 303(B) REQUIRES THAT AT LEAST 5 PERCENT OF THE PRICE OF DATA SOLD TO THE GOVERNMENT BE REBATED TO THE TREASURY. AGAIN, WE FEEL THAT THIS PROVISION UNDULY RESTRICTS FLEXIBILITY OF THE BIDDER IN STRUCTURING HIS BID. WHILE REBATES IN CONNECTION WITH

GOVERNMENT PURCHASES MAY BE A PERFECTLY ACCEPTABLE WAY TO GO, IT IS NOT IN THE GOVERNMENT'S INTEREST TO REQUIRE THIS ARRANGEMENT. SUCH A REQUIREMENT WILL ONLY NARROW THE RANGE OF CHOICES AVAILABLE TO THE SECRETARY IN SELECTING THE BEST DEAL FOR THE GOVERNMENT.

LICENSING PROVISIONS

TITLE IV OF THE BILL, DEALING WITH THE LICENSING OF PRIVATE REMOTE SENSING SPACE SYSTEMS, IS OUTSIDE THE SCOPE OF THE RFP PROCESS, AND THEREFORE NOT RELATED TO THE SEB'S ACTIVITIES. HOWEVER, I WOULD LIKE TO MENTION TWO ASPECTS OF TITLE IV WHICH CAUSE THE ADMINISTRATION SOME CONCERN.

SECTION 403 OF THE BILL APPARENTLY WOULD AUTHORIZE THE SECRETARY OF COMMERCE TO LICENSE THE CIVIL REMOTE SENSING ACTIVITIES OF OTHER FEDERAL AGENCIES TO THE EXTENT THEY ARE CARRIED OUT IN CONSORTIUM WITH PRIVATE SECTOR PARTIES. WE BELIEVE THIS PROVISION WOULD CHANGE EXISTING LAW, UNDER WHICH AGENCIES SUCH AS NASA CAN ENGAGE IN JOINT RESEARCH AND DEVELOPMENT WITH PRIVATE INDUSTRY. ALTHOUGH SUCH ENDEAVORS ARE FULLY SUBJECT TO THE REQUIREMENTS OF EXISTING FEDERAL LAW, NO LICENSE FROM THE DEPARTMENT OF COMMERCE IS CURRENTLY REQUIRED. WE ARE NOT IN A POSITION TODAY TO DETERMINE WHETHER OR TO WHAT EXTENT REGULATION WILL BE NECESSARY TO

PREVENT ABUSE. THAT DETERMINATION WILL DEPEND LARGELY ON MARKET CONDITIONS.

WE SUGGEST THAT THE PURPOSES OF TITLE IV WOULD BE ADEQUATELY SERVED BY LIMITING EXPLICITLY THE LICENSING AUTHORITY OF THE SECRETARY TO CIVIL OPERATIONAL SYSTEMS, IN CONTRAST TO RESEARCH AND DEVELOPMENT. AS FOR R & D PROJECTS, IN WHICH NASA ENGAGES WITH PRIVATE ENTITIES, IT SHOULD BE CLEARLY STATED THAT NASA CAN CONTINUE TO ENTER INTO AGREEMENTS, WITH OR WITHOUT REIMBURSEMENT, AS IS THE CASE PRESENTLY.

SECTION 404(B) OF THE BILL REQUIRES THAT THE PROMULGATION OF REGULATIONS AND ISSUANCE OF LICENSES BE CARRIED OUT ONLY AFTER "PUBLIC NOTICE AND HEARINGS IN ACCORDANCE WITH TITLE V OF THE UNITED STATES CODE." WE ARE CONCERNED THAT THIS LANGUAGE MAY BE INTERPRETED AS REQUIRING A FORMAL RULEMAKING PROCESS IN THE PROMULGATION OF REGULATIONS BY THE SECRETARY, AS WELL AS PRIOR TO THE ISSUANCE OF TITLE IV LICENSES. WE ARE OF THE VIEW THAT A FORMAL RULEMAKING IS A FAR MORE COMPLICATED PROCESS THAN OUGHT TO BE REQUIRED IN THESE INSTANCES. WE WOULD THEREFORE LIKE TO SEE THIS PROVISION CLARIFIED TO REQUIRE ONLY NOTICE AND COMMENT RULEMAKING IN CONNECTION WITH THE PROMULGATION OF REGULATIONS AND THE ISSUANCE OF LICENSES.

I SHOULD NOTE IN THIS REGARD OUR SUPPORT OF SECTION 403(F) OF THE BILL, WHICH WOULD PERMIT FORMAL ADJUDICATIONS, ON PETITION, IN THE CASE OF DENIALS OF LICENSE APPLICATIONS, LICENSE SUSPENSIONS, REVOCATIONS, AND THE LIKE.

NONDISCRIMINATORY ACCESS TO DATA

THE ADMINISTRATION IS CONCERNED ABOUT THE REQUIREMENT IN THE BILL THAT DATA FROM COMMERCIAL OPERATIONAL SYSTEMS BE MADE AVAILABLE ON A NONDISCRIMINATORY BASIS. WHILE THIS HAS BEEN THE GOVERNMENT'S PRACTICE IN THE PAST, WE ARE NOT CONVINCED THAT THE SAME PRINCIPLE SHOULD BE APPLIED TO A COMMERCIAL VENTURE. WE INTEND THAT THE RFP PROCESS WILL PROVIDE US WITH INPUT FROM U.S. INDUSTRY REGARDING ANY CHANGES WE MAY WISH TO CONSIDER IN OUR PAST PRACTICES. WE HAVE, OF COURSE, ENCOURAGED THE BIDDERS TO ADHERE TO PAST GOVERNMENT PRACTICES IN THIS REGARD. WE RECOGNIZE THAT REQUIRING THAT DATA FROM OPERATIONAL SYSTEMS BE AVAILABLE ON A NONDISCRIMINATORY BASIS WOULD BE APPROPRIATE FOR AS LONG AS THE GOVERNMENT CONTINUES TO OWN THE SYSTEM.

COPYRIGHT PROTECTION

SECTION 603 OF THE BILL WOULD HAVE THE EFFECT OF PERMITTING ANY SYSTEM OPERATOR TO SELL SATELLITE DATA UNDER THE CONDITION THAT THE DATA WILL NOT BE REPRODUCED OR

REDISSEMINATED BY THE PURCHASER. THE PURPOSE OF THIS PROVISION IS APPARENTLY TO SECURE FOR THE SYSTEM OPERATOR PROTECTIONS AND PROPERTY RIGHTS SIMILAR TO THOSE OFFERED BY THE COPYRIGHT LAWS. WE ENDORSE THIS PRINCIPLE. WE WOULD, HOWEVER, SUGGEST THAT, RATHER THAN LEAVE OPEN THE QUESTION OF WHETHER SUCH DATA MAY, IN FACT, BE COPYRIGHTED BEFORE SALE (AND THUS, THE QUESTION OF WHETHER THE SYSTEM OPERATOR'S LEGAL REMEDIES FOR VIOLATIONS MAY BE FOUND IN CONTRACT LAW OR UNDER THE COPYRIGHT LAWS), THE BILL SIMPLY PROVIDE THAT SYSTEM OPERATORS MAY COPYRIGHT THEIR DATA UNDER THE COPYRIGHT LAWS.

ROLES OF THE DEPARTMENTS OF STATE AND DEFENSE

SECTION 606 OF THE BILL REQUIRES THAT THE SECRETARY OF COMMERCE CONSULT WITH THE SECRETARIES OF STATE AND DEFENSE REGARDING MATTERS INVOLVING NATIONAL SECURITY AND OUR INTERNATIONAL OBLIGATIONS, RESPECTIVELY. HOWEVER, THIS SECTION APPARENTLY VESTS IN THE SECRETARY AUTHORITY TO DETERMINE WHAT ADDITIONAL CONDITIONS SHALL BE IMPOSED ON SYSTEM OPERATORS FOR REASONS OF NATIONAL SECURITY AND INTERNATIONAL OBLIGATIONS. IN OUR VIEW, THIS AUTHORITY RIGHTLY BELONGS WITH THE SECRETARIES OF DEFENSE AND STATE, RESPECTIVELY. WE WOULD THEREFORE SUGGEST AMENDMENT OF THIS SECTION TO ENSURE

THAT THE EXISTING AUTHORITIES OF THE DEPARTMENTS OF DEFENSE AND STATE ARE IN NO WAY DIMINISHED BY THE BILL.

OTHER ISSUES

FINALLY, MR. CHAIRMAN, I WOULD LIKE TO MAKE A FEW COMMENTS OF A MORE TECHNICAL NATURE.

- REPORTING. SECTION 502(D) OF THE BILL PROVIDES FOR JOINT PREPARATION AND TRANSMITTAL TO THE CONGRESS BY THE ADMINISTRATORS OF NOAA AND NASA OF A REPORT CONTAINING, AMONG OTHER THINGS, A UNIFIED NATIONAL PLAN FOR REMOTE SENSING RESEARCH AND DEVELOPMENT APPLIED TO THE EARTH AND ITS ATMOSPHERE. OUR EXPERIENCE WITH SUCH JOINT REPORTING IS THAT IT WORKS POORLY, AT BEST. WE WOULD RECOMMEND THAT THE REQUIREMENT FOR A JOINT REPORT BE DELETED.

- CAPITAL COSTS. IT HAS BEEN SUGGESTED THAT THE MENTION OF LAUNCH SERVICES IN CONNECTION WITH "SUBSTANTIAL ASSISTANCE" IN SECTION 604(A) OF THE BILL COULD POSSIBLY CREATE DOUBT AS TO WHETHER THESE ARE "CAPITAL COSTS" OF THE CONTRACTOR. WE WOULD SUGGEST DELETION OF THIS REFERENCE IN ORDER TO CLARIFY THAT A CONTRACTOR'S CAPITAL COSTS INCLUDE LAUNCH COSTS.

- FREQUENCY ALLOCATION. SECTION 605 OF THE BILL ENCOURAGES THE ALLOCATION OF GOVERNMENT AND OTHER CIVIL RADIO FREQUENCIES TO LICENSE HOLDERS BY THE SECRETARY AND THE FEDERAL COMMUNICATIONS COMMISSION. WE RECOMMEND THAT LANGUAGE BE ADDED TO SECTION 605 WHICH REFLECTS THE PRIMARY RESPONSIBILITY OF THE FEDERAL COMMUNICATIONS COMMISSION FOR THE ISSUANCE OF LICENSES FOR THE TRANSMISSION OF RADIO SIGNALS.

- REIMBURSEMENT OF ADDITIONAL COSTS. SECTION 606(C)(2) OF THE BILL PROVIDES FOR REIMBURSEMENT TO SYSTEM OPERATORS BY THE GOVERNMENT OF ADDITIONAL COSTS IMPOSED FOR REASONS OF NATIONAL SECURITY OR INTERNATIONAL OBLIGATIONS. THE BILL ALSO APPEARS TO AUTHORIZE REIMBURSEMENT OF "LOST INVESTMENTS". WHILE THE TERM "LOST INVESTMENTS" PROBABLY IS SYNONYMOUS WITH "CAPITAL COSTS", WE WOULD PREFER TO AMEND THIS PROVISION TO CLARIFY THAT THE GOVERNMENT WILL NOT REIMBURSE AN OPERATOR FOR LOST INCOME OR PROFITS. THIS WOULD BE FULLY CONSISTENT WITH THE LONGSTANDING FEDERAL POLICY IN THIS AREA.

MR. CHAIRMAN, LET ME CONCLUDE MY PREPARED STATEMENT BY REITERATING WHAT I STATED AT THE OUTSET. H.R. 4836 IS A MAJOR STEP FORWARD TOWARD ESTABLISHING THE LEGAL FRAMEWORK FOR A UNITED STATES COMMERCIAL OPERATIONAL LAND REMOTE SENSING SYSTEM. I WOULD BE HAPPY TO ANSWER YOUR QUESTIONS AT THIS TIME.

Mr. **Volkmer**. Thank you very much, Mr. Bishop. I do have some questions. First, I would like to know if you can inform us how our most recent Landsat is doing. It went up, I understand, all right.

Mr. **Bishop**. I can, indeed. And with great delight, I can inform you how our current Landsat is doing. The launch was letter perfect. The satellite was inserted into orbit within 700 meters of the target altitude, which is really a rather remarkable success in that regard.

The solar panels were deployed on schedule perfectly. All the command and data systems were tested and worked. The communications systems have now been tested and they work. We have taken one pass with the multispectral scanner and I have the first pictures on my staff's desk out in Suitland this morning.

We have tried the thematic mapper and have one picture in process from that. The event for today will be to unfurl the antenna that will allow us to talk to the TDRSS. So far, everything has just been perfect with the satellite.

Mr. **Volkmer**. Very good.

Now, you have mentioned several areas of concern that you have with the bill in the RFP process that is ongoing. Are any of these, as the legislation progresses, would you say prevent further activity on the RFP process?

Mr. **Bishop**. Sir, I do not believe any of the provisions of the legislation that we have before us this morning are what I might call show stoppers. I have that feeling for several reasons:

One, we told the bidders explicitly in our RFP to be aware of the congressional concerns and even cited draft legislation that the committee staff had prepared earlier.

The differences between the bill and the RFP are small. We have our own hunches as to what form the bids will take and it is my judgment that none of the things that we can conceive as the SEB—but maybe some bidder can conceive of something other than that.

But nothing that we can conceive on the SEB would be ruled out completely by what is in the bill today.

Mr. **Volkmer**. All right. As I understand it, too, you mentioned that you have some amendments which you would like for us to look at. We plan to do markup on this bill next week.

Mr. **Bishop**. We will see that they are up here within days.

Mr. **Volkmer**. I would like to have them yet this week, I do not want them the day before.

Mr. **Bishop**. Yes, sir. We will see that that happens.

Mr. **Volkmer**. The subcommittees that have worked on this bill have generally agreed on the principle of "open sky"—nondiscimininatory access. I hope that has been brought to the attention of the bidders in the RFP process because I think that is one area, probably, where you are going to find very little resiliency in the committee.

Mr. **Bishop**. We have become aware of that, sir, as we have gone through the process of working with your staffs on that. I am sure all the bidders are aware. We told them about it in the RFP, it has been mentioned in a lot of public forums and you have just again put it on the record here today.

Mr. **Volkmer**. You have touched on your testimony and I have not been able to go through all of it. We have specified in the bill that we have a minimum requirement that the commercial enterprise would provide at least MSS data quality.

Has this been in any way detrimental in the RFP process? I know there was some misunderstanding, we found that out during our hearings, that some looked at it that we were requiring MSS as such, but we were not. We are saying "quality".

Mr. **Bishop**. I think, sir, that the SEB and the committees have come to the same conclusion, that we are just not interested as a Government in supporting an operation of lesser capability than something like the MSS. I do not believe that it has had any detrimental effect on the process of the RFP. In fact, it is specified in the RFP.

Mr. **Volkmer**. Now, are you satisfied that future technical advances in land sensing would be driven by the marketplace, by the private sector?

Mr. **Bishop**. Yes, I am. I am reasonably convinced of that for two reasons. One is that the development of new technologies will not cease, particularly with the strong language about continuing R&D programs that you have in this bill, and the intentions of the agencies to continue.

Second, we already know that some companies, like the oil companies and geological exploration companies, have a need for better data than the MSS itself can provide.

Therefore, there is a market there. Its size is as of yet unknown. We will perhaps learn some more from the market studies that the bidders will submit to us in the course of their bidding under the RFP.

Mr. **Volkmer**. Now, we also—as you pointed out—have a disagreement—and I can see it is not a large one and I am sure we can work this out—on the time period in which we need Government, yet, involvement at least to the extent of assisting any commercialization sector.

We say a 6-year period for data continuity. Yours is what, 12 or 8? That is what I cannot understand.

Mr. **Bishop**. Our clock for the 12-year number starts ticking in 1985, the most optimistic time when we could sign a contract. The period we specified was the length of time for the complete contract that would encompass both your title II and title III.

The clock for your 6 years starts ticking when the new entity launches its new commercial satellite. We merely believe that that company needs about 8 years from some financial models—admittedly very crude financial models—we have run ourselves.

Mr. **Volkmer**. You are saying 8 years from the time that they launch.

Mr. **Bishop**. From the time that they have their own new, which commercially would not occur prior to probably 1987. That would be my guess, but we have to wait until we see the bids.

Mr. **Volkmer**. Right. There is really no difference, it is just a question of where do you start.

Mr. **Bishop**. I think that is right, sir.

Mr. **Volkmer**. But we end about the same time.

Mr. **Bishop**. Approximately so.

Mr. **Volkmer**. Do you have any idea of what we are talking about as far as total Government support over this period of time, have your models told you anything about that, how much we are going to have to put into this?

Mr. **Bishop**. Sir, I do not have any real idea but I can offer an upper limit. If someone were to come in and ask for a Government support in excess of what it would have cost us to run our own Government system, I can assure you that we would find that not a very good deal for the taxpayer.

But our models give us an enormous range of numbers, depending on the assumptions they put in. I really hesitate to speculate about how much it would be.

Mr. **Volkmer**. But you are assured enough that it would be less than if the Government continued to operate the system for the 6- or 12-year period, whichever, up to the year, let us say, 1994.

Mr. **Bishop**. None of our crude calculations came anywhere close to the cost, the yearly cost, of the present Landsat system.

Mr. **Volkmer**. Can you give us the present—and not right now for the record, after you return to the office you can give it to us—what are the anticipated annual costs, at least for this year, fiscal year and next fiscal year, and the following fiscal year for the cost to the Government?

Mr. **Bishop**. I would be delighted to submit that later for the record. I do not have the numbers at my fingertips.

[This material referred to follows:]

The annual cost to the Government for continued operation of the Landsat system under Title III cannot be estimated with any reasonable level of accuracy prior to the selection of a specific contractor. There are a number of factors which will affect the Government's cost in the early years, including:

- the timing and cost of the construction and launching of follow-on satellites;
- the costs of operation of the system;
- the expected level of revenues from the sales of the products to all users; and
- the amount of up-front capital investment by the contractor in the systems that will be operated.

The table below breaks out the outyear costs of providing four follow-on spacecraft and their launches. These costs amount to an average annual cost from FY 1985 through FY 1994 of $183 million per year for spacecraft and launching. This table provides as a reference point the upper limit of the total cost for operations if the Government were to continue with the current capability of Landsat 4 and 5. The Request For Proposals and the House Bill H.R. 4836 require as a minimum MSS-level data which could be provided at a substantially lower cost. We also expect that a private contractor may be able to create additional savings in satellite construction and operations.

The table includes only the gross costs of continued operation of a system equivalent to the current Landsats. It does not reflect the inflow of revenues from sales or the amount of capital investment by the contractor.

LANDSAT COSTS

(dollars in millions)

	84	85	86	87	88	89	90	91	92	93	94	95	96	97
OPERATIONS	33	39	39	39	40	40	40	40	40	40	40	40	40	40
SPACECRAFT AND LAUNCHING														
D^{1}	26													
D^{11} & D^{111}	29	101	171	157	106	58	49	54						
D^{IV} & D^{V}							38	131	222	204	138	75	64	70 1/
TOTAL S/C & LAUNCH	55	101	171	157	106	58	87	185	222	204	138	75	64	70
TOTAL LANDSAT PROGRAM	88	140	210	196	146	98	127	225	262	244	178	115	104	110
LAUNCHES	▲ D^{1}				▲ D^{11}			▲ D^{111}			▲ D^{IV}			▲ D^{V}

1/ Based on Landsat D^{11} and D^{111} estimates and inflated at 5% per year.

Mr. VOLKMER. Now, do you feel that the bill itself gives sufficient authority to the Secretary to perform oversight responsibilities as we go into commercialization?

Mr. BISHOP. Yes, sir, I really do. We said in the RFP that we saw very little need for additional authority beyond what authority the Secretary already has. In the provisions of your bill, you have gone a bit beyond even what we thought would be absolutely necessary.

So, indeed, it does give him plenty of authority.

Mr. VOLKMER. All right, now, the RFP provides that the award be only made to a U.S. firm, as I understand it.

Mr. BISHOP. That is correct.

Mr. VOLKMER. What criteria do we use to determine whether it is a "U.S. firm", is a U.S. firm a corporation incorporated in the State of Delaware by two individuals, one of which is a U.S. citizen and the other which came from any place else, but is funded solely from another country?

Mr. BISHOP. Let me tell you the criteria and then see if I can test your concept against those criteria.

We went through the Department of Defense procurement regulations and came up with four items. They were: That the principal place of business be in the United States; that corporate officers be U.S. citizens; that the key management team be U.S. citizens; and that the firm have filed an income tax return in the United States.

Recognizing that we might get some new entities that might not pass one of these tests, we then added one additional clause which said, if it is a conglomerate, a team—as we expect some of the bids may be—that the individual entities had to pass those previous tests.

Now, the example you just gave me of a firm which had at least one of its partners a U.S. citizen and it was formed in the State of Delaware—and we are not specifying where the financial support came from—would at least pass that test, I think.

We went a little bit farther, however.

Mr. VOLKMER. But the total stock—as I understand from what you are telling me is—the total stock could be held by non-United States citizens, the majority of the stock.

Mr. BISHOP. It could under that test, but we added an additional test. We went to the Department of Energy regulations for nuclear materials—procurements that involve nuclear materials—and extracted from that some concepts about foreign interest in a firm.

Indeed, major or entire financial holdings by foreign entities would be a foreign interest and although that test is not a "yes" or "no" test, it would certainly weigh heavily as we looked at them.

I am not expressing myself terribly well.

Mr. VOLKMER. In other words, it is not a determining factor by itself.

Mr. BISHOP. It is not a determining factor by itself.

Mr. VOLKMER. The concern is, majority owned by a foreign national for a foreign government would not in itself prohibit it from being able to enter into a contract for the commercialization agreement.

Mr. BISHOP. I believe that is true. However, if there is—I was just reminded by Mr. Levine, who is the lawyer on our team—if there is substantial foreign interest in the firm, the contracting officer can take steps under the contract to reduce that foreign interest or make it such that it does not threaten some national security or other aspect of the system.

Mr. **Volkmer**. Do you anticipate that the bidders will propose to buy and receive title to the Landsat satellites ground hardware?

Mr. **Bishop**. I have to say I do not know because we have not seen the bids. But there were some questions asked us about the availability of some of that equipment. So, I would say from that, at least some of the firms were considering wanting to have that equipment.

But I could not tell whether that would be the period during the Landsat operation or afterward.

Mr. **Volkmer**. In making your later-on assessment of the proposals that are made to you, will you take into consideration cost to the Government of any tax advantages that the proposers will receive as a result of purchase of satellites or equipment?

Mr. **Bishop**. Yes, sir, it is our intention to look at the entire cost to the Government, whether it be loss of revenues from taxes, the price of the data that we want to buy, any up-front payment that we have to make, we will look at the total cost to the Government.

Mr. **Volkmer**. Personally, I have a troubling, let me say, thought in my mind about the process that you are following with the RFP as far as commercialization itself and whether it will actually be competitive with, say, SPOT or anything else in the business sector unless there is a great deal of what we call private sector marketing.

Now, the RFP does not address the marketing function itself.

Mr. **Bishop**. Oh, yes, sir; it does. We asked very explicitly for a marketing plan from the firms and financial projections for every year of the proposed contract, with pro forma tables, balance sheets, and others.

We will look at those quite carefully. I suspect that will occupy about half of our assessment time, where we are looking at their financial projections and their marketing plan.

Mr. **Volkmer**. But the difference between the RFP then and our bill is that we require in the proposal that the Secretary contract for the marketing of the data?

Mr. **Bishop**. You require that the Secretary contract for marketing the data during the lifetime of the Government Landsat system.

The RFP merely asks the bidders to bid on their follow-on system—that is beyond the life of the Landsat—and consider, if they wish, taking over operation which would include marketing of the data the Government system in the meantime.

Mr. **Volkmer**. Will not the evaluation of the proposals include any proposals for marketing the data of the Landsat system?

Mr. **Bishop**. Yes, sir, it will. We have asked for separate volumes in the proposals for the follow-on system—the company's own commercial system, that is—and the Landsat system if they wish to take over operation of that.

Mr. **Volkmer**. Well, maybe we should further discuss this because one of the principal reasons for the need, supposedly, for commercialization of the Landsat system was that the U.S. Government just does not know how to market. So, we need to turn this over to the private sector so that they will get out and market it. There is a huge potential market out there and value-added services. We have a $1 billion industry in the future, and that if the Government supposedly just gets out the way and lets the private sector take it over, they will get into it and really market it.

So, some of us want to make sure that they will market it. You understand what we are saying?

Mr. **Bishop**. I understand.

Mr. **Volkmer**. The push behind commercialization of Landsat is to get the Government out and let the pricate sector market it, and go ahead and market.

Mr. **Bishop**. I think the administration shares that goal. Our strategy was to focus the RFP on the follow-on commercial system and say that is what we want—to become sort of a silent partner with the private sector.

But we too believed that there was some value to a company operating and marketing the data from the Government's Landsat system in the interim, and that is why we allowed that.

The only difference is that you require it and we allow it.

Mr. **Volkmer**. Yes. Well, the reason we require it is, I think, goes back to maybe a little suspicion on some of our part that if all we have out there is the commercialization of the Landsat in the first years is nothing more than a Government subsidy to somebody to have a land sensing system and to market it as they want to but they really do not have to because the Government will pick up the tab in the meantime. You understand the concern?

Mr. **Bishop**. I understand the concern.

Let me just say, Mr. Chairman, that for us operationally as the procurement agency to the Government, if we found a bid that we liked that did not want to take on the Government's Landsat system during the several years that it would still be alive, your bill would merely require us to go to a second additional procurement to market the data from the Landsat system which we could, of course, do.

Mr. **Volkmer**. Does your RFP give incentive to whoever is, say, the successful bidder, to use aggressive marketing during the period of use of the Government Landsat? In other words, profit purposes, is there any incentive for them to do that?

Mr. **Bishop**. Yes, there would be. The model in our RFP is that they would have the rights to that data, essentially a copyright, but the Government would not sell them and then they would not be in the public domain, as the data from Landsat is today.

It is very much like your bill in that regard.

Mr. **Volkmer**. Of course, on that end some of us feel—and am sure this may be subject to negotiation—to see how things go on the question of a rebate back to the Government for the sales, the 5 percent to the Government.

Mr. **Bishop**. I would like to express a personal view which is not necessarily an administration view on that one, Mr. Chairman.

If there is a certain amount of money that a company needs from the Government as a subsidy--or through some other form—in order for them to start up this enterprise, and we at the same time impose on them a rebate on data that it sells to the Government, that merely raises the amount of money that they need from us in the subsidy or whatever the other form is.

So, it is really taking money out of one of the Government's pockets and putting it in another one.

Mr. **Volkmer**. In other words, you are saying it is really robbing Peter to pay Paul.

Mr. **Bishop**. Right.

Mr. **Volkmer**. To anticipate what that 5 percent is going to be and then put it back in their bid?

Mr. **Bishop**. I believe that is what I would do, if I were such a bidder.

Mr. **Volkmer**. On the question of capitalization and structuring financial proposals, I think that use of loans et cetera, if you would submit an amendment on that, I think we could at least take a good look at it. We do not want to, I do not think, in any way try to impinge on anyone in their capitalization structure. So, we would be more than happy to examine that and see if we can work it out.

Mr. **Bishop**. We will look at some specific language and get it up here promptly, sir.

Mr. **Volkmer**. Because if we are going to go into such things as loans or loan guarantees, you presently have the authority within the Commerce Department to issue those?

I did not think so. I did not think you did. But if there is, that is something we will have to look at. If you are already looking at it with the bidders and they are going to come in and want that type of financing, then I think we probably have to run that by OMB, too.

Mr. **Bishop**. We will.

Mr. **Volkmer**. Especially if it is guaranteed.

Now, I do not quite understand the difference between this—I know there is a little bit—the difference between again getting back to the Government guaranteed or not guaranteed data purchases. We specifically provide there to be no guarantee on the amount the Government will purchase.

Mr. **Bishop**. That is correct. We, on the other hand, allow the bidders to specify a guaranteed purchase, should they care to. We do not demand it.

Mr. **Volkmer**. That does not mean, necessarily, that you would accept that bid?

Mr. **Bishop**. That is correct.

Mr. **Volkmer**. All right. We do not have the slightest idea yet what the bidders will probably propose.

Mr. **Bishop**. We do not.

Mr. **Volkmer**. It only really becomes a problem if all of them propose a guarantee, a certain amount—variations but, I mean, if every one of them wants a guarantee, then it creates a little bit of a problem.

Mr. **Bishop**. Or it could be a problem if an otherwise excellent bid would be disqualified on that basis.

Mr. **Volkmer**. On the licensing authority for regulation, issuance of license, I think we can clarify that too if you get the language up here. We would like to work together with you on that, so that we use the notice and comment rulemaking. I think that is probably satisfactory to us, also.

Mr. Bishop. We will have some suggested language there.

Mr. Volkmer. And the licensing to apply just to civil operational systems, not necessarily to research and development also. I think we can work that out.

On the role of the Departments of State and Defense which you have commented on, we quite agree on that also. But we also feel that there may be instances where because, again, of national security and other reasons the Department of Defense may wish the Secretary of Commerce to take action rather than the Secretary of Defense to take action. You understand what I am saying.

Mr. Bishop. I understand. The contracting officer will be an employee of the Department of Commerce, and many of the actions that can and will be taken, will be taken through that contracting officer and therefore by the Secretary of Commerce, of course.

Mr. Volkmer. I see on page 14, on other issues, the very first one on reporting on the joint report, you would like to have that requirement deleted.

As I understand it, this is only intended in the area of joint research and development.

Mr. Bishop. That is the way I read it also, sir.

Mr. Volkmer. I would like to know if you can, if you cannot, maybe later on we can get somebody from Commerce and NASA both come over here and tell us why they cannot get together and make up a little report.

Mr. Bishop. I think what is reflected in there, sir, is that a lot of us in the executive departments have seen interagency reporting functions done before. It is our experience as a body, I believe, that someone needs to be the boss in doing a job like a report such as that.

Your words in there has it being a joint report without a designated lead.

Mr. Volkmer. Constant squabbling.

Mr. Bishop. I am sorry, sir.

Mr. Volkmer. Constant squabbling. Basically, what you are telling me if we have to designate somebody to take the lead, that you cannot get people together. I am not blaming you. I am just saying, it appears to me that the agencies cannot get people together to write a report, both of which they have to do with the subject matter. Both should be working together for the good of the country.

Mr. Bishop. All true, sir. [Laughter.]

Mr. Volkmer. Personally I think, I am sorry but I think we are going to leave it in there. Maybe we will never see a report.

[Laughter.]

Mr. Bishop. If you leave it in there, you will see a report, sir.

Mr. Volkmer. If necessary that one of them write—like we do up here when we write a report on a bill, that somebody write a "majority opinion," and somebody can write "minority opinion" separately, and yet joint, I guess.

Does the gentleman from California have any questions?

Do you have any idea which agency—if we go back to the report—which agency should be, or would you like to say who would be the lead agency?

Mr. **Bishop**. I think, sir, either agency would be happy to be the lead agency. [Laughter.]

Mr. **Volkmer**. I would anticipate—and I may be wrong—but I would anticipate in the function of R&D especially that probably NASA would be more involved in the actual research. Do you agree or disagree with that?

Mr. **Bishop**. Both agencies have a strong program. NASA's is the larger.

Mr. **Volkmer**. Does the gentlelady from Rhode Island have any questions?

Mrs. **Schneider**. Despite the fact that I arrived late because I was in another hearing, I am curious to know what the impact might be of H.R. 4836 on the various university research projects, the research community at universities.

Mr. **Bishop**. That is a concern that folks on the Source Evaluation Board have shared and we have put a lot of words into an appendix and the RFP, encouraging that there be no impact.

One of two things could happen. If the price for the individual data that the researcher might need goes up, then hopefully his granting agency will increase the grant enough to cover that.

Alternatively, it is possible because such research generally leads to new applications which means new markets, that the potential bidders will have an interest in seeing those researchers served fairly cheaply.

We do not know what the bidders will have to say about that sort of thing. So, except for such speculation, I really cannot say what the impact would be. We would hope not much at all because that is such a valuable component of our ongoing programs.

Mrs. **Schneider**. Well, I guess all of us would hope that the impact would not be too great. But I also assume that we do not have any better way to base our anticipation of what will occur.

Mr. **Bishop**. You are correct, we will not know until we see the bids and have some idea of the pricing structures that the bidders have in mind. Even then, we will not know until the agencies take a look at their supported research and decide how they are going to cope with the new data source.

Mrs. **Schneider**. Aside from the cost element, do you think it is going to be more difficult for the university sector to receive the data that will be necessary, based on the scenarios outlined in this bill?

Mr. **Bishop**. Based on what is in the bill, no; I would think not. As it is now, a university researcher has to purchase a scene from the EROS Data Center. In this case, it just changes the source for his scene. If anything, since this new entity is going to be quite keen on selling, it might actually become easier.

Mrs. **Schneider**. Thank you very much. Thank you, Mr. Chairman.

Mr. **Volkmer**. Along that line, I would just like to get into another question we have not discussed, I think it has some impact on researchers, especially universities which concerns me also, availability of data and the cost of it.

Did the RFP address the question of archiving the data?

Mr. **Bishop**. It does indeed. We made a careful distinction between an inventory that the operator might want to sell to prospective customers, and an archive that would be kept by the Government for historical, retrospective reasons.

We asked the bidders to explicitly address how their bid would make both functions possible.

Mr. VOLKMER. And is there any anticipated time period in which data would go into the archives?

Mr. BISHOP. We asked them to tell us, and we offered two models, either of which would be acceptable or there might be another model.

One said the data could come to the Government immediately that it was taken and put into the operator's inventory. But the Government would then protect that data and not release it.

Or, as the data loses its commercial value, it could be turned over to the Government or offered to the Government as the operator purged his own inventory.

Mr. VOLKMER. What I was trying to get at, to see if there is any time period or what time period there would be before, let us say, a researcher who wishes to obtain the data for research purposes, not for basic commercial purposes. What is the time period before the data would be available from the archives? We will not know that until we see the bid?

Mr. BISHOP. We set no such time period, we have to wait and see what the bidders have to say.

Mr. VOLKMER. So, it may be a year or 2 years before they get it.

Mr. BISHOP. Some of the data may maintain a fairly high commercial value for a decade, perhaps. We do not know.

Mr. VOLKMER. So, if that is the case, that is not a source for your researchers, then.

Mr. BISHOP. The researcher could indeed buy the data from the operator.

Mr. VOLKMER. Yes; he can buy it originally, but if the price goes up—we had hearings and some people were concerned about the pricing policy of the commercial sector.

The other side to that is that the person that is doing it, is not going to want to make it too high because he wants to sell it. If he makes it too high, he cannot sell it. So, I think we will just have to review it very carefully to make sure that especially university researchers who do not have a lot of money will still be able to obtain data for further research.

Mr. BISHOP. It is a concern that we share, that was somewhat outside the scope of the RFP, however.

Mr. VOLKMER. The gentleman from Virginia.

Mr. BATEMAN. Thank you, Mr. Chairman.

Could you comment on the recommendations of the Department of Commerce's Advisory Committee concerning multispectral scanner versus the thematic mapper?

Mr. BISHOP. Yes; the committee, chaired by Dr. Halbouty, made four recommendations to the Secretary out of their last meeting. One of those was that the baseline, the minimum capability for the next operational system via Government or private, should be something of capability like the thematic mapper.

We specified in the RFP a minimum capability of the multispectral scanner because we found, as we polled Government users, that that was sort of their baseline. But we also encouraged in the RFP a better technology.

The recommendation has been noted by the Secretary. I am not sure how he will use that recommendation.

Mr. **Bateman**. Well, let me see if I can followup on that because I am inquiring in an area where I am not nearly so familiar as I need to be.

Which would represent the highest or the greatest advance in the state of the art?

Mr. **Bishop**. Well, both instruments are flying on the satellites that we have up now. In fact, we just got the first thematic mapper scene from Landsat 5 yesterday.

So, the state of the art is those two instruments. The thematic mapper is the more capable instrument, both in terms of the number of spectral bands that it has and the resolution on the ground that it can provide.

Mr. **Bateman**. And the thematic mapper sees more and records more than the multispectral scanner?

Mr. **Bishop**. Yes, sir. It is like having a larger telescope and being able to see in more colors.

Mr. **Bateman**. What are the tradeoffs that make it less than obvious that we ought to go in the direction of the thematic mapper and let the multiscanner go by the wayside?

Mr. **Bishop**. The theory that the Source Evaluation Board used is that the system, the commercial system which is what we hope to get out of this RFP exercise, should be driven by the market.

We set a minimum of the multispectral scanner because we, as part of that market, did not want to become a silent partner with something of lesser capability than the multispectral scanner. But the theory was that it should be market driven.

If the market is there for the better data, then we expect the bidders will tell us they are going to fly something that is more capable.

Mr. **Bateman**. In other words, you are seeking to let the market make the determination.

Mr. **Bishop**. Yes, sir.

Mr. **Bateman**. Thank you.

Thank you, Mr. Chairman.

Mr. **Volkmer**. In the spirit of cooperation on the question that you mention on page 15 on reimbursement of additional costs, clarifying the language on a question of lost investments, I will be glad—and I am sure the committee will be glad—to work with you on clarifying that also. We agree with you on that.

At this time—I should have done that originally and I missed it—for the record I would like to have the opening statement, which will be furnished to the reporter, of Congressman James Scheuer, chairman of the other subcommittee, inserted immediately after my opening statement.

I ask unanimous consent that that be done. Hearing no objection, it will be ordered.

I have no additional questions. Does anyone else have any additional questions?

I have just been handed a note, I guess I do have another question. It is an interesting one. [Laughter.]

Mr. VOLKMER. The gentleman from Virginia discussed the recommendation of the Halbouty committee. Are any members of the Halbouty committee also in on the bidding process?

Mr. BISHOP. Sir, Mr. Halbouty asked his committee members that question and four of them volunteered that they were involved or might be involved in one way or another. I do not have the names with me. Indeed, four of them were.

Mr. VOLKMER. Is there any concern about a conflict of interest there?

Mr. BISHOP. I have no concern because I think the recommendations were quite neutral, save maybe for the one on the thematic mapper. That one, I am not sure how the Secretary is going to use the recommendation in any case.

Mr. VOLKMER. Does not the language in the bill pretty well take care of that problem?

Mr. BISHOP. I think it does.

Mr. VOLKMER. Just by saying a minimum requirement?

Mr. BISHOP. I think it does. The bill and the RFP are quite consistent in that regard.

Mr. VOLKMER. All right.

Mr. Bishop, I want to thank you very much for taking your time to be with us today and I look forward to discussing this further with you as the time progresses, and your staff.

Also, like I said before, any proposed amendments, I would like to see them—hopefully—before the end of the week; before Friday, if possible.

Mr. BISHOP. We will do that, sir. Thank you.

Mr. VOLKMER. Thank you.

The hearing will adjourn.

[Whereupon, at 10:35 a.m., the subcommittees adjourned, to reconvene subject to the call of the Chair.]

APPENDIX

98TH CONGRESS
2D SESSION

H. R. 4836

To establish a system to promote the use of land remote-sensing satellite data, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 9, 1984

Mr. FUQUA (for himself, Mr. WINN, Mr. SCHEUER, Mr. VOLKMER, Mr. LUJAN, Mr. MCGRATH, Mr. NELSON of Florida, Mr. WALKER, Mr. RALPH M. HALL, Mr. CARNEY, Mr. DYMALLY, Mr. CHANDLER, Mr. ANDREWS of Texas, Mr. BATEMAN, Mr. MACKAY, Mr. LEWIS of Florida, and Mr. GREGG) introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To establish a system to promote the use of land remote-sensing satellite data, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Land Remote-Sensing Commercialization Act of 1984".

TITLE I—DECLARATION OF FINDINGS, PURPOSES, AND POLICIES

FINDINGS

SEC. 101. The Congress finds and declares that—

(1) the continuous civilian collection and utilization of land remote-sensing data from space is of major benefit in managing the Earth's natural resources and in planning or conducting many other activities of economic importance;

(2) the national interest of the United States lies in maintaining international leadership in civil remote-sensing and in broadly promoting the beneficial use of remote-sensing data;

(3) land remote-sensing by the Government or private parties of the United States affects international commitments and policies and national security concerns of the United States;

(4) the broadest and most beneficial use of land remote-sensing data is likely to result from maintaining a policy of nondiscriminatory access to data;

(5) use of land remote-sensing data has been inhibited by slow market development and by the lack of assurance of data continuity;

(6) the private sector, and in particular the "value-added" industry, is best suited to develop land remote-sensing data markets;

(7) vigorous, competitive, market-driven private sector involvement in land remote-sensing can lead to

rapid realization of the potential benefits of that technology;

(8) to utilize fully the strengths of the private sector, any process of commercialization of land remote-sensing should involve the maximum practicable competition and the minimum (both in duration and amount) practicable government subsidy;

(9) at the present time, it is unclear that the private sector alone will develop a total land remote-sensing system because of the high risk and large capital expenditures involved;

(10) cooperation between the Federal Government and the private sector can help assure both data continuity and United States leadership;

(11) the time is now appropriate to initiate such cooperation with phased transition to a fully commercial system;

(12) cooperation between Government and the private sector in civil land remote-sensing should be structured so as to minimize Government direction and regulation and maximize private sector involvement;

(13) nevertheless, certain Government oversight must be maintained to assure that private sector activities are in the national interest and that the interna-

tional commitments and policies of the United States are honored; and

(14) there is no compelling reason to commercialize meteorological satellites at this time.

PURPOSES

SEC. 102. It is therefore the purpose of this Act—

(1) to guide the United States Government in promoting full, prompt, and proper involvement of the private sector in civil land remote-sensing from space;

(2) to maintain the United States leading position in civil remote-sensing, preserve its national security, and fulfill its international obligations;

(3) to prescribe conditions for assuring continuity of remote-sensing data while protecting public and private non-discriminatory access to these data;

(4) to minimize the duration and amount of any further Federal investment that might be necessary to achieve full commercialization of civil land remote-sensing; and

(5) to prohibit commercialization of meteorological satellites at this time.

POLICIES

SEC. 103. (a) It shall be the policy of the United States to preserve its right to acquire and disseminate digital remote-sensing data.

(b) It shall be the policy of the United States that civilian digital remote-sensing data be made available to all potential users on a nondiscriminatory basis.

(c) It shall be the policy of the United States both to commercialize those space remote-sensing functions that properly lend themselves to private sector operation and to avoid competition by the Government with such commercial operations, while continuing to preserve our national security, to honor our international obligations, and to retain in the Government those remote-sensing functions that are essentially of a public service nature.

DEFINITIONS

SEC. 104. For purposes of this Act—

(1) The term "digital remote-sensing data" means the unprocessed and minimally processed signals collected from civil remote-sensing space systems or original film products collected from such systems. Such minimal processing shall be limited to rectification of instrumental distortions, registration with respect to features on the Earth, and calibration of spectral response. Such term does not include conclusions, manipulations, or calculations derived from such signals or combination of the signals with other data or information. Unless otherwise limited, digital remote-sensing data includes land and ocean sensed data.

(2) The term "Secretary" means the Secretary of Commerce.

(3)(A) The term "on a nondiscriminatory basis" means without preference, bias, or any other special arrangement regarding delivery, format, financing, or technical considerations which would favor one buyer or class of buyers over another.

(B) The sale of data is made on a nondiscriminatory basis only if (i) any offer to sell or deliver data is advertised in advance and is equally available to all prospective buyers; (ii) the system operator has not established or changed any price, policy, procedure, or other term or condition in a manner which gives one buyer or class of buyer de facto favored access to data; and (iii) in a case where a system operator offers volume discounts, such discounts are no greater than the demonstrable reductions in the cost of such sales. The sale of data on a nondiscriminatory basis does not preclude the system operator offering discounts other than volume discounts to the extent that such discounts are not inconsistent with any other provision of this paragraph.

(C) The sale of data on a nondiscriminatory basis does not require (i) that a system operator disclose names of buyers or information concerning their purchases; (ii) that a system operator maintain all, or any particular subset of, data in a working inventory; or (iii) that a system operator expend equal effort in developing all segments of a market.

(4) The term "Landsat system" means Landsat 1, 2, 3, 4, and 5, and related ground equipment, systems, and facilities, and any successor civil land remote-sensing satellites launched by the United States Government prior to the commencement of the six-year period described in section 302(b)(2).

(5) The term "system operator" means a contractor under title II or a license holder under title IV.

TITLE II—CONTRACT FOR EXISTING LAND REMOTE-SENSING SATELLITE SYSTEM

CONTRACT REQUIREMENTS

SEC. 201. (a) In accordance with the requirements of this Act, the Secretary shall, subject to the availability of appropriations therefor, contract with a United States private sector party (as defined by the Secretary) to market digital remote-sensing data generated by the Landsat system. If the Secretary determines that competition for such contract will be improved and that it will promote the policies and purposes of this Act, the Secretary may accept proposals for such contract which include the operation by the private sector party of (1) the space component of the Landsat system, (2) the related ground equipment, systems, and facilities, or (3) both such space component and such related equipment, systems, and facilities.

(b) A contract awarded under subsection (a) shall be awarded, after competition, in accordance with the conditions of section 203. Such contract may be reawarded competitively after the practical demise of the space segment of the Landsat system, as determined by the Secretary.

(c) Any contract authorized by subsection (a)—

(1) shall not permit the transfer to any contractor of title to any part or all of the Landsat system; and

(2) may specify that the contractor use, and, at his own expense, maintain, repair, modify, or replace elements of the Landsat system as the contractor finds necessary for commercial operations.

(d) If, as a result of the competitive process required by subsection (b), the Secretary receives no proposal which he finds acceptable under the conditions of this Act, the Secretary shall so certify and fully report his findings to the Congress. Thirty days after so certifying and reporting, the Secretary may reopen the competition. If no acceptable proposals are received after such subsequent competition, or if the Secretary decides not to reopen the competition, the Secretary shall so certify and fully report his findings to the Congress. In the event that no acceptable proposal is received, the Secretary shall continue to operate the Landsat system and to market data from such system.

(e) In defining "United States private sector party" for purposes of subsection (a), the Secretary may take into account key personnel, location of assets, foreign ownership, control, and influence, and other such factors.

SALE OF DATA

SEC. 202. (a) The United States Government shall retain title to any and all data generated by the Landsat system. However, after the date of the commencement of the contract described in section 201(a), the contractor shall be entitled to the revenues from sales of copies of data from the Landsat system, subject to the conditions specified in sections 601 and 602 of this Act.

(b) The contractor may continue to sell data previously generated by the Landsat system after the demise of the space segment of that system.

CONDITIONS OF COMPETITION FOR CONTRACT

SEC. 203. (a) The Secretary of Commerce shall, as part of his advertisement for the competition for the contract authorized by section 201, identify and publish the international obligations, national security concerns (with appropriate protection of sensitive information), domestic legal considerations, and any other standards or conditions which a private contractor shall be required to meet.

(b) In selecting a contractor under this title, the Secretary shall consider—

(1) ability to market aggressively digital remote-sensing data;

(2) the best financial return to the Government, including payment of royalties on data sales and the ability to operate the system at a saving to the Government;

(3) ability to meet the obligations, concerns, standards, and conditions identified under subsection (a);

(4) technical competence, including the ability to assure continuity and timeliness of data from the Landsat system;

(5) absence of any conflicts of interest which could inhibit nondiscriminatory access to such data;

(6) ability to effect a smooth transition with the contractor selected under title III of this Act; and

(7) such other factors as he deems appropriate.

FOREIGN GROUND STATIONS

SEC. 204. (a) The contract under this title shall provide that the contractor shall act as the agent of the Secretary by continuing to supply digital remote-sensing data to foreign ground stations for the life, and according to their terms, of those agreements between the United States Government and such foreign ground stations that are in force on the date of the commencement of the contract.

(b) Upon the expiration of such agreements, or in the case of foreign ground stations that have no agreement with the United States on the date of commencement of the contract, the contract shall provide—

(1) that digital remote-sensing data from the Landsat system shall be made available to foreign ground stations only by the contractor; and

(2) that such data shall be made available on a nondiscriminatory basis.

(c) The Secretary of State may take steps to ensure such nondiscriminatory availability of data.

TITLE III—PROVISION OF DATA CONTINUITY DURING TRANSITION PERIOD

PURPOSES AND DEFINITIONS

SEC. 301. (a) It is the purpose of this title—

(1) to provide, in an orderly manner and with minimal risk, for a transition between Government operation and private, commercial operation of civil land remote-sensing space systems; and

(2) to provide for the continuity of MSS data for six years after the practical demise of the space segment of the Landsat system.

(b) For purposes of this title—

(1) the term "Multi-Spectral Scanner" means the instrument referred to by that name and carried on the Landsat 4 and Landsat 5 satellites; and

(2) the term "MSS data" means digital remote-sensing data which, from the point of view of a data user, are—

(A) functionally equivalent to data from the Multi-Spectral Scanner; and

(B) compatible with data and with equipment used to receive and process data from such Scanner.

CONTRACT FOR DATA AVAILABILITY AND CONTINUITY

SEC. 302. (a) Subject to the availability of appropriations therefor and to the licensing conditions established under title IV, the Secretary shall, after competition, contract with a United States private sector party (as defined by the Secretary pursuant to section 201) for the provision by such party of the capability of generating data of a quality at least equal to the quality of MSS data and of selling and delivering such data to the Federal Government. The capability shall include, at a minimum, the capability to generate and deliver MSS data at the annual volume of Federal usage during fiscal year 1983, as determined by the Secretary. The capability may be provided by the contractor using whatever technologies the contractor may select. In addition, the contractor may make available data of a higher quality or of a different type than MSS data.

(b) The contract authorized by subsection (a)—

(1) shall be entered into as soon as practicable, allowing for the competitive procurement process;

(2) shall, in accordance with criteria determined and published by the Secretary, reasonably assure the provision of the capability described in subsection (a) for a period of six years, beginning as soon as practicable in order to minimize any interruption of data availability;

(3) shall terminate one year after the expiration of the six-year period described in paragraph (2);

(4) may, subject to section 305 of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 255), provide for a payment by the Secretary to cover a portion of the capital cost of providing such capability, which may be paid in installments (A) based on progress prior to the beginning of the six-year period described in paragraph (2), and (B) the sum of which shall be less than the total cost of procuring the system required to assure the capability for six years;

(5) shall provide that sale of digital remote-sensing data shall be in accordance with the provisions of section 303 of this title;

(6) shall not provide for any guaranteed data purchases by the Federal Government; and

(7) may provide that the contractor utilize, on a space-available basis, civilian Government satellites as platforms for a civil remote-sensing satellite system, if—

(A) the contractor immediately reimburses the Government for all related costs incurred with respect to such utilization, including a reasonable and proportionate share of fixed, spacecraft, data transmission, and launch costs; and

(B) such utilization would not interfere with or otherwise in any way compromise the intended civilian Government missions, as determined by the agency responsible for the civilian satellite.

(c) The contract authorized by subsection (a) shall be awarded on the basis of—

(1) the one-time cost to the Government of providing the capability;

(2) the reliability, technical competence, and financial condition of the contractor;

(3) the contractor's ability to develop the remote-sensing data market;

(4) the contractor's ability to supplement basic capabilities specified in section 302(a) by adding remote-

sensing capabilities (at the contractor's expense and consistent with national security concerns) which maintain United States leadership in remote-sensing;

(5) the contractor's ability to meet the conditions for obtaining a license under title IV;

(6) the contractor's ability to provide digital remote-sensing data on a timely and reliable basis;

(7) the contractor's ability to effect a smooth transition with any contractor selected under title II;

(8) the royalty or profit- or revenue-sharing arrangement, or other such rebate offered to the Federal Government; and

(9) such other factors as the Secretary deems appropriate.

(d) If, as a result of the competitive process required by subsection (a), the Secretary receives no proposal which he finds acceptable under the conditions of this Act, the Secretary shall so certify and fully report his findings to the Congress. Thirty days after so certifying and reporting, the Secretary may reopen the competition. If no acceptable proposals are received after such subsequent competition, or if the Secretary decides not to reopen the competition, the Secretary shall so certify and fully report his findings to the Congress. Ninety days after so certifying and reporting, the Secretary is authorized to assure MSS data continuity by procurement and operation by the Federal Government of the necessary systems, subject to the availability of appropriations therefor. Such procurement and operation may include generation of data of a higher quality than MSS data.

SALE OF DATA

SEC. 303. (a) The contractor selected under section 302 shall sell data in accordance with the provisions of sections 601 and 602 of this Act.

(b) Any sale of digital remote-sensing data by the contractor to Federal agencies shall be on a nondiscriminatory basis, with the additional condition that at least 5 per centum of the price of each such sale shall be rebated to the Government (and thereby reduce the total net cost to the Government) as a royalty payment to the United States Treasury. Such royalty payments shall be required during the life of the contract authorized in section 302, or until such time as the cumulative total of such royalty payments equals the value of any payment made to the contractor by the Government under section 302(b)(4), whichever first occurs. Data sales to non-Federal buyers shall not be subject to such a rebate.

(c) After the six-year period described in section 302(b)(2), the contractor may continue to sell data and, if licensed under title IV of this Act, to operate a civil remote-sensing space system.

REPORT

SEC. 304. Two years after the date of the commencement of the six-year period described in section 302(b)(2) the Secretary shall report to the President and to the Congress on the progress of the transition to fully private financing, ownership, and operation of remote-sensing space systems, together with any recommendations for actions, including actions necessary to ensure United States leadership in civilian land remote-sensing from space.

TITLE IV—LICENSING OF PRIVATE REMOTE-SENSING SPACE SYSTEMS

GENERAL AUTHORITY

SEC. 401. The Secretary is authorized, after consultation with other appropriate Federal agencies, to grant, suspend, modify, or revoke licenses under this title, and to take any other such actions as he deems necessary in order to carry out the provisions of this title.

CONDITIONS FOR OPERATION

SEC. 402. (a) No party or consortium may operate any remote-sensing space system which is subject to the jurisdiction or control of the United States (as determined by the Secretary) without a license pursuant to section 403.

(b) A consortium or private sector party may only be licensed to operate a remote-sensing space system subject to the following conditions:

(1) The system shall be operated in such manner as to preserve and promote the national security of the United States and to observe and implement the international obligations of the United States.

(2) Digital remote-sensing data shall be made available to all potential users on a nondiscriminatory basis.

(3) In the case of a consortium, the system shall be administered by a central, responsible entity established by the consortium for that purpose.

(4) No license issued under this title shall protect the license holder from fair competition from other license holders.

(5) Before any consortium or private sector party terminates its operations under the license, it shall make disposition of any orbiting satellites in a manner satisfactory to the President.

(6) Any consortium or private sector party proposing to be licensed under section 403 shall agree, as a condition for the receipt of such license, to provide to the Secretary any data generated under such license which the Secretary may request for the purpose of archiving pursuant to section 602.

(7) For the purposes of ensuring compliance with the provisions of this Act concerning nondiscriminatory

access to data, any consortium or private sector party proposing to be licensed under section 403 shall agree, as a condition for the receipt of such license—

(A) to notify the Secretary of any "value-added" activities (as defined by the Secretary by regulation) that will be conducted by the licensee or by a subsidiary or affiliate of the licensee; and

(B) to provide the Secretary with a plan for the conduct of such activities which will ensure compliance with such provisions concerning nondiscriminatory access.

AUTHORITY OF THE SECRETARY

SEC. 403. (a) The Secretary is authorized to license qualified private sector parties, consortia of private sector parties, or consortia of private sector parties and Government agencies to operate civil remote-sensing space systems in accordance with the provisions of this Act.

(b) Any license issued under subsection (a) shall be in effect for such period as the Secretary may specify.

(c) Any person may apply to the Secretary for issuance, transfer, or termination of a license under this title in a form and manner prescribed by the Secretary. Each application under this section shall set forth the activities proposed to be carried out under the license, including measures taken to comply with those operating requirements specified in section 402 of this Act.

(d) No license shall be granted by the Secretary unless he determines in writing that the applicant will comply with the requirements of this Act, the regulations issued pursuant to this Act, and the international obligations and national security concerns of the United States. The Secretary shall review any application and make a determination thereon within one hundred and twenty days of the receipt of an application. If final action has not occurred within such time, the Secretary shall inform the applicant of any pending issues and of actions required to resolve them.

(e) The Secretary may revoke, suspend, or modify a license issued under this title if the Secretary determines and notifies the licensee in writing that the licensee has substantially failed to comply with any provision of this Act, with any regulation issued under this Act, with any terms, conditions, or restrictions of such license, or with any international obligation or national security concern of the United States.

(f) Any applicant or licensee who makes a timely request for review of a denial of issuance, transfer, revocation, suspension, conditioning, or modification of a license shall be entitled to adjudication by the Secretary on the record after an opportunity for an agency hearing with respect to such denial. Any final action by the Secretary under this subsection shall be subject to judicial review under chapter 7 of title 5, United States Code.

REGULATORY AUTHORITY OF THE SECRETARY

SEC. 404. (a) The Secretary may issue regulations to carry out the provisions of this title.

(b) Regulations issued by the Secretary under this title and the issuance, transfer, revocation, suspension, conditioning, or modification of any license issued under this title shall be carried out only after public notice and hearings in accordance with the provisions of title 5, United States Code.

ENFORCEMENT AUTHORITY OF THE SECRETARY

SEC. 405. (a) Each license issued by the Secretary may require the licensee—

(1) to allow the Secretary or his designated officers to inspect any financial or business records associated with remote-sensing or "value-added" activities, or

(2) to allow the Secretary or his designated officers to inspect any space-related or ground segment hardware or software to be utilized by the licensee in remote-sensing activities.

(b) It is unlawful for any person to violate any regulation or provision of any license issued under this Act, to violate any space treaty or law implementing any space treaty, or to prevent or inhibit the monitoring of remote-sensing activities or "value-added" activities by the Secretary or his designated officers.

(c) Any person who after notice and opportunity to be heard in accordance with title 5, United States Code, is found by the Secretary to have committed any act prohibited by subsection (b) shall be liable for a civil penalty of not more than $10,000 for each violation. Each day of continuing operation in violation shall constitute a separate penalty. The Secretary may compromise, modify, or remit any such civil penalty.

(d) For the purpose of conducting any hearing under this section, the Secretary may issue subpenas for any materials, documents, or records, or for the attendance and testimony of witnesses.

(e) In carrying out his enforcement responsibilities, the Secretary may—

(1) seize any object, record, or report where it reasonably appears that such was used, is being used, or is likely to be used in violation of this Act; or

(2) make investigations and inquiries and administer to or take from any person an oath affirmation or affidavit concerning any matter relating to the enforcement of this Act.

(f) The Secretary is authorized to terminate any licensed operations on an immediate basis when it reasonably appears that continued operation in violation of any provision of this Act, or any provision of a license issued under this Act, or of any obligation of the United States under a space treaty, would be detrimental to the national interest.

AGENCY ROLES

SEC. 406. (a) The Secretary shall offer his offices for assistance in the formation of consortia under this title.

(b) Federal agencies are authorized and encouraged to conduct joint ventures in remote-sensing space systems by forming consortia with private firms (which consortia will not compete with other United States private sector activities) in accordance with the provisions of sections 402 and 403 of this Act, if—

(1) such activities are appropriate to the agencies' mission; and

(2) appropriated funds are available for that purpose.

TERMINATION

SEC. 407. If, five years after the expiration of the six-year period described in section 302(b)(2), no firm or consortium has been licensed and continued in operation under the provisions of this title, the authority of this title shall terminate.

TITLE V—RESEARCH AND DEVELOPMENT

PURPOSE AND POLICY

SEC. 501. It is the purpose of this title to provide for a comprehensive program of research, technology, and monitoring of the phenomena of the atmosphere, oceans, and land surfaces using the capabilities of remote-sensing from space.

CONTINUED FEDERAL RESEARCH AND DEVELOPMENT

SEC. 502. (a) The Administrator of the National Aeronautics and Space Administration, the Administrator of the National Oceanic and Atmospheric Administration, and the heads of other appropriate Federal agencies are directed to conduct programs of remote-sensing research and development and are encouraged to conduct experimental space remote-sensing programs (including applications demonstration programs and basic research at universities) and to develop remote-sensing technologies and techniques in support of their authorized missions, using funds appropriated for those purposes. In carrying out such programs Federal agencies are authorized and encouraged to cooperate with private industry, universities, State and local governments, foreign governments, and international organizations.

(b) The Administrator of the National Oceanic and Atmospheric Administration shall establish a continuing program of applications research and monitoring of the atmosphere, oceans, and land surfaces.

(c) The National Aeronautics and Space Administration shall, pursuant to its authority under title IV of the National Aeronautics and Space Act of 1958, continue programs of research, technology, and monitoring of the atmosphere, oceans, and land surfaces.

(d) The Administrators of the National Oceanic and Atmospheric Administration and the National Aeronautics and Space Administration shall, within one year after the date of enactment of this Act and biennially thereafter, jointly develop and transmit to the Congress a report which includes (1) a unified national plan for remote-sensing research and development applied to the Earth and its atmosphere; (2) a compilation of progress in the relevant ongoing research and development activities of the Federal agencies; and (3) an assessment of the state of our knowledge of the Earth and its atmosphere, the needs for additional research (including research related to operational Federal remote-sensing space programs), and opportunities available for further progress.

USE OF EXPERIMENTAL DATA

SEC. 503. Data gathered in Federal experimental space remote-sensing programs may be used in related research and development programs funded by the Federal Government (including applications programs) and cooperative research programs, but not for commercial uses or in competition with private sector activities, except as permitted by section 504.

SALE OF EXPERIMENTAL DATA

SEC. 504. Data gathered in Federal experimental space remote-sensing programs may be competitively sold en bloc (consistent with national security interests and international obligations of the United States) to any United States entity which will market the data on a nondiscriminatory basis.

TITLE VI—GENERAL PROVISIONS

NONDISCRIMINATORY DATA AVAILABILITY

SEC. 601. (a) Any digital remote-sensing data generated by any system operator under the provisions of this Act shall be made available to all users on a nondiscriminatory basis in accordance with the requirements of this Act.

(b) Any system operator shall make publicly available the prices, policies, procedures, and other terms and conditions upon which the operator will sell such data.

ARCHIVING OF DATA

SEC. 602. (a) It is in the public interest for the United States Government—

(1) to maintain an archive of land remote-sensing satellite data for historical, scientific, and technical purposes, including long-term global environmental monitoring;

(2) to control the content and scope of the archive; and

(3) to assure the quality, integrity, and continuity of the archive.

(b) The Secretary shall provide for long-term storage, maintenance, and upgrading of a basic land remote-sensing data set (hereafter referred to as the "basic data set") and shall follow reasonable archival practices to assure proper storage and preservation of the basic data set and timely access for parties requesting data. The basic data set which the Secretary assembles in the Government archive shall remain distinct from any inventory of data which a system operator may maintain for sales and for other purposes.

(c) In determining the initial content of, or in upgrading, the basic data set, the Secretary shall—

(1) use as a baseline the MSS data currently archived;

(2) take into account future technical and scientific developments and needs;

(3) consult with and seek the advice of users and producers of remote-sensing data and data products, keeping the Congress advised of such contacts;

(4) consider the public's need for data which may be duplicative in terms of geographical coverage but

which differ in terms of season, spectral bands, resolution, or other relevant factors; and

(5) include, as the Secretary deems appropriate, digital remote-sensing data generated either by the Landsat system, pursuant to title III, or by license holders under title IV.

(d) All original data (or copies thereof) shall, on request, be made promptly available to the Secretary by any system operator in a form suitable for processing for data storage, maintenance, and access. The Secretary is authorized (subject to the availability of appropriations) to pay to such system operator reasonable costs for reproduction and transmittal of any such data.

(e) Any system operator shall have the exclusive right to sell all data that the operator provides to the United States remote-sensing data archive for a period to be determined by the Secretary but not to exceed ten years from the date the data are sensed. In the case of data generated from the Landsat system prior to the implementation of the contract described in section 201(a) of this Act, the system operator shall have the exclusive right to sell such data for a period determined by the Secretary but not to exceed ten years after the implementation of such contract. A system operator may relinquish his exclusive right and consent to distribution from the archive before the period of exclusive right has expired by terminating his offer to sell particular data.

(f) After expiration of such exclusive right to sell, or after relinquishment of such right, the data provided to the United States remote-sensing data archive shall be in the public domain and shall be made available to requesting parties by the Secretary at prices reflecting reasonable costs of reproduction and transmittal.

(g) In carrying out the functions of this section, the Secretary may use existing facilities or may contract with a private sector party or parties for the performance of such functions, subject to the availability of appropriations therefor.

NONREPRODUCTION

SEC. 603. Digital remote-sensing data generated by any system operator under the provisions of this Act may be sold under the condition that such data will not be reproduced and disseminated by the purchaser.

REIMBURSEMENT FOR ASSISTANCE; SALE OF EQUIPMENT

SEC. 604. (a) The Administrator of the National Aeronautics and Space Administration, the Secretary of Defense, and the heads of other Federal agencies are authorized to provide assistance to system operators under the provisions of this Act. Substantial assistance, such as launch services, shall be reimbursed by the system operator.

(b) The Secretary may allow a licensee under section 403, or any other private sector party, to buy or otherwise acquire the use of equipment from the Landsat system, when such equipment is no longer needed for the operation of that system or for the sale of data from that system. Officials of other Federal civilian agencies are authorized and encouraged to cooperate with the Secretary in carrying out this subsection.

RADIO FREQUENCY ALLOCATION

SEC. 605. The Federal Communications Commission and the Secretary are encouraged to allocate to any license holder under title IV of this Act access to Government radio frequencies and other civil radio frequencies appropriate for space remote-sensing systems in a timely manner consistent with international obligations and with the national interest.

CONSULTATION

SEC. 606. (a) The Secretary shall consult with the Secretary of Defense on all matters under this Act affecting national security. The Secretary of Defense shall be responsible for identifying and notifying the Secretary of those national security concerns of the United States which are relevant to activities under this Act.

(b)(1) The Secretary shall consult with the Secretary of State on all matters under this Act affecting international obligations. The Secretary of State shall be responsible for identifying and notifying the Secretary of those international obligations of the United States which are relevant to activities under this Act.

(2) The Secretary of State is authorized and encouraged to provide land remote-sensing data, technology, and training to developing nations as a component of programs of international aid.

(c)(1) The Secretary is authorized to make determinations as to the appropriateness and reasonableness of conditions based on national security or international obligations which Federal agencies may seek to impose on any system operator.

(2) If, as a result of conditions imposed on a system operator on the basis of national security or international obligations, the Secretary determines that additional costs will be incurred by the system operator, or investments will be lost to the system operator, the Secretary may require the agency or agencies requesting such conditions to reimburse the system operator for such additional costs or lost investments.

RELATION TO OTHER LAWS

SEC. 607. The requirements of this Act are in addition to, and not in lieu of, any other provision of law.

AUTHORIZATION OF APPROPRIATIONS

SEC. 608. (a) There are authorized to be appropriated to the Secretary $10,000,000 for fiscal year 1985 for the purpose of carrying out the provisions of this Act.

(b) The authorization provided for under subsection (a) shall be in addition to moneys authorized pursuant to title II of the National Aeronautics and Space Administration Authorization Act of 1983 (Public Law 97-324).

TITLE VII—PROHIBITION OF COMMERCIALIZATION OF WEATHER SATELLITES

PROHIBITION

SEC. 701. Neither the President nor any other official of the Government shall make any effort to lease, sell, or transfer to the private sector, commercialize, or otherwise dismantle any portion of the weather satellite systems operated by the Department of Commerce or any successor agency.

FUTURE CONSIDERATIONS

SEC. 702. Regardless of any change in circumstances subsequent to the enactment of this Act, even if such change makes it appear to be in the national interest to commercialize weather satellites, neither the President nor any official shall make any effort to commercialize weather satellites unless this title has first been repealed.

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Union Calendar No. 367

98TH CONGRESS
2D SESSION

H. R. 5155

[Report No. 98–647]

To establish a system to promote the use of land remote-sensing satellite data, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MARCH 15, 1984

Mr. FUQUA (for himself, Mr. WINN, Mr. SCHEUER, Mr. VOLKMER, Mr. LUJAN, Mr. MCGRATH, Mr. NELSON of Florida, Mr. WALKER, Mr. RALPH M. HALL, Mr. CARNEY, Mr. DYMALLY, Mr. CHANDLER, Mr. ANDREWS of Texas, Mr. BATEMAN, Mr. MACKAY, Mr. LEWIS of Florida, Mr. GREGG, Mr. SKEEN, Mr. AKAKA, Mr. LOWERY of California, Mr. TORRICELLI, Mr. DURBIN, Mr. SENSENBRENNER, and Mr. BOEHLERT) introduced the following bill; which was referred to the Committee on Science and Technology

APRIL 3, 1984

Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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A BILL

To establish a system to promote the use of land remote-sensing satellite data, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Land Remote-Sensing Commercialization Act of 1984".

TITLE I—DECLARATION OF FINDINGS, PURPOSES, AND POLICIES

FINDINGS

SEC. 101. The Congress finds and declares that—

(1) the continuous civilian collection and utilization of land remote-sensing data from space is of major benefit in managing the Earth's natural resources and in planning or conducting many other activities of economic importance;

(2) the national interest of the United States lies in maintaining international leadership in civil remote-sensing and in broadly promoting the beneficial use of remote-sensing data;

(3) land remote-sensing by the Government or private parties of the United States affects international commitments and policies and national security concerns of the United States;

(4) the broadest and most beneficial use of land remote-sensing data is likely to result from maintaining a policy of nondiscriminatory access to data;

(5) use of land remote-sensing data has been inhibited by slow market development and by the lack of assurance of data continuity;

(6) the private sector, and in particular the "value-added" industry, is best suited to develop land remote-sensing data markets;

(7) vigorous, competitive, market-driven private sector involvement in land remote-sensing can lead to rapid realization of the potential benefits of that technology;

(8) to utilize fully the strengths of the private sector, any process of commercialization of land remote-sensing should involve the maximum practicable competition and the minimum (both in duration and amount) practicable Government subsidy;

(9) at the present time, it is unclear that the private sector alone will develop a total land remote-sensing system because of the high risk and large capital expenditures involved;

(10) cooperation between the Federal Government and the private sector can help assure both data continuity and United States leadership;

(11) the time is now appropriate to initiate such cooperation with phased transition to a fully commercial system;

(12) cooperation between Government and the private sector in civil land remote-sensing should be

structured so as to minimize Government direction and regulation and maximize private sector involvement;

(13) nevertheless, certain Government oversight must be maintained to assure that private sector activities are in the national interest and that the international commitments and policies of the United States are honored; and

(14) there is no compelling reason to commercialize meteorological satellites at this time.

PURPOSES

SEC. 102. It is therefore the purpose of this Act—

(1) to guide the United States Government in promoting full, prompt, and proper involvement of the private sector in civil land remote-sensing from space;

(2) to maintain the United States leading position in civil remote-sensing, preserve its national security, and fulfill its international obligations;

(3) to prescribe conditions for assuring continuity of civil land remote-sensing data while protecting public and private nondiscriminatory access to these data;

(4) to minimize the duration and amount of any further Federal investment that might be necessary to achieve full commercialization of civil land remote-sensing; and

(5) to prohibit commercialization of meteorological satellites at this time.

POLICIES

SEC. 103. (a) It shall be the policy of the United States to preserve its right to acquire and disseminate digital remote-sensing data.

(b) It shall be the policy of the United States that civilian digital remote-sensing data be made available to all potential users on a nondiscriminatory basis.

(c) It shall be the policy of the United States both to commercialize those space remote-sensing functions that properly lend themselves to private sector operation and to avoid competition by the Government with such commercial operations, while continuing to preserve our national security, to honor our international obligations, and to retain in the Government those remote-sensing functions that are essentially of a public service nature.

DEFINITIONS

SEC. 104. For purposes of this Act:

(1) The term "digital remote-sensing data" means the unprocessed and minimally processed signals collected from civil remote-sensing space systems or original film products collected from such systems. Such minimal processing shall be limited to rectification of instrumental distortions, registration with respect to

features on the Earth, and calibration of spectral response. Such term does not include conclusions, manipulations, or calculations derived from such signals or combination of the signals with other data or information. Unless otherwise limited, digital remote-sensing data includes land and ocean sensed data.

(2) The term "Secretary" means the Secretary of Commerce.

(3)(A) The term "on a nondiscriminatory basis" means without preference, bias, or any other special arrangement regarding delivery, format, financing, or technical considerations which would favor one buyer or class of buyers over another.

(B) The sale of data is made on a nondiscriminatory basis only if (i) any offer to sell or deliver data is published in advance in such manner as will ensure that the offer is equally available to all prospective buyers; (ii) the system operator has not established or changed any price, policy, procedure, or other term or condition in a manner which gives one buyer or class of buyer de facto favored access to data; and (iii) in a case where a system operator offers volume discounts, such discounts are no greater than the demonstrable reductions in the cost of such sales. The sale of data on a nondiscriminatory basis does not preclude the system operator offering discounts other than volume discounts to the extent that such discounts are not inconsistent with any other provision of this paragraph.

(C) The sale of data on a nondiscriminatory basis does not require (i) that a system operator disclose names of buyers or their purchases; (ii) that a system operator maintain all, or any particular subset of, data in a working inventory; or (iii) that a system operator expend equal effort in developing all segments of a market.

(4) The term "Landsat system" means Landsat 1, 2, 3, 4, and 5, and related ground equipment, systems, and facilities, and any successor civil land remote-sensing satellites operated by the United States Government prior to the commencement of the six-year period described in section 302(b)(2).

(5) The term "system operator" means a contractor under title II or a license holder under title IV.

TITLE II—CONTRACT FOR EXISTING LAND REMOTE-SENSING SATELLITE SYSTEM

CONTRACT REQUIREMENTS

SEC. 201. (a) In accordance with the requirements of this Act, the Secretary shall, subject to the availability of appropriations therefor, contract with a United States private sector party (as defined by the Secretary) to market digital remote-sensing data generated by the Landsat system. If the Secretary determines that competition for such contract will promote the policies and purposes of this Act, the Secretary may accept proposals for such contract which include the operation by such United States private sector party of (1) the space component of the Landsat system, (2) the related ground equipment, systems, and facilities, or (3) both such space component and such related equipment, systems, and facilities.

(b) A contract awarded under subsection (a) shall be awarded, after competition, in accordance with the conditions of section 203. Such contract may be reawarded competitively after the practical demise of the space segment of the Landsat system, as determined by the Secretary.

(c) Any contract authorized by subsection (a)—

(1) shall not permit the transfer to any contractor of title to any part or all of the Landsat system; and

(2) may specify that the contractor use, and, at his own expense, maintain, repair, or modify elements of the Landsat system as the contractor finds necessary for commercial operations.

(d) If, as a result of the competitive process required by subsection (b), the Secretary receives no proposal which he finds acceptable under the conditions of this Act, the Secretary shall so certify and fully report his findings to the Congress. Thirty days after so certifying and reporting, the Secretary may reopen the competition. If no acceptable proposals are received after such subsequent competition, or if the Secretary decides not to reopen the competition, the Secretary shall so certify and fully report his findings to the Congress. In the event that no acceptable proposal is received, the Secretary shall continue to operate the Landsat system and to market data from such system.

(e) In defining "United States private sector party" for purposes of subsection (a), the Secretary may take into account the citizenship of key personnel, location of assets, foreign ownership, control, and influence, and other such factors.

SALE OF DATA

SEC. 202. (a) The United States Government shall retain title to any and all data generated by the Landsat system. However, after the date of the commencement of the contract described in section 201(a), the contractor shall be entitled to revenues from sales of copies of data from the Landsat system, subject to the conditions specified in sections 601 and 602 of this Act.

(b) The contractor may continue to market data previously generated by the Landsat system after the demise of the space segment of that system.

CONDITIONS OF COMPETITION FOR CONTRACT

SEC. 203. (a) The Secretary of Commerce shall, as part of his advertisement for the competition for the contract authorized by section 201, identify and publish the international obligations, national security concerns (with appropriate protection of sensitive information), domestic legal considerations, and any other standards or conditions which a private contractor shall be required to meet.

(b) In selecting a contractor under this title, the Secretary shall consider—

(1) ability to market aggressively digital remote-sensing data;

(2) the best overall financial return to the Government, including the potential savings to the Government;

(3) ability to meet the obligations, concerns, standards, and conditions identified under subsection (a);

(4) technical competence, including the ability to assure continuity and timeliness of data from the Landsat system;

(5) absence of any conflicts of interest which could inhibit nondiscriminatory access to such data;

(6) ability to effect a smooth transition with the contractor selected under title III of this Act; and

(7) such other factors as he deems appropriate.

FOREIGN GROUND STATIONS

SEC. 204. (a) The contract under this title shall provide that the contractor shall act as the agent of the Secretary by continuing to supply digital remote-sensing data to foreign ground stations for the life, and according to their terms, of those agreements between the United States Government and such foreign ground stations that are in force on the date of the commencement of the contract.

(b) Upon the expiration of such agreements, or in the case of foreign ground stations that have no agreement with the United States on the date of commencement of the contract, the contract shall provide—

(1) that digital remote-sensing data from the Landsat system shall be made available to foreign ground stations only by the contractor; and

(2) that such data shall be made available on a nondiscriminatory basis.

TITLE III—PROVISION OF DATA CONTINUITY DURING TRANSITION PERIOD

PURPOSES AND DEFINITIONS

SEC. 301. (a) It is the purpose of this title—

(1) to provide, in an orderly manner and with minimal risk, for a transition between Government op-

eration and private, commercial operation of civil land remote-sensing space systems; and

(2) to provide for the continuity of MSS data for six years after the practical demise of the space segment of the Landsat system.

(b) For purposes of this title—

(1) the term "Multi-Spectral Scanner" means the instrument referred to by that name and carried on the Landsat 4 and Landsat 5 satellites; and

(2) the term "MSS data" means digital remote-sensing data which, from the point of view of a data user, are—

(A) functionally equivalent to data from the Multi-Spectral Scanner; and

(B) compatible with data and with equipment used to receive and process data from such Scanner.

CONTRACT FOR DATA AVAILABILITY AND CONTINUITY

SEC. 302. (a) Subject to the availability of appropriations therefor and to the licensing conditions established under title IV, the Secretary shall, after competition, contract with a United States private sector party (as defined by the Secretary pursuant to section 201) for the provision by such party of the capability of generating data of a quality at least equal to the quality of MSS data and of selling and delivering such data to the Federal Government. The capability shall include, at a minimum, the capability to generate and deliver MSS data at the annual volume of Federal usage during fiscal year 1983, as determined by the Secretary. The capability may be provided by the contractor using whatever technologies the contractor may select. In addition, the contractor may make available data of a higher quality or of a different type than MSS data.

(b) The contract authorized by subsection (a)—

(1) shall be entered into as soon as practicable, allowing for the competitive procurement process;

(2) shall, in accordance with criteria determined and published by the Secretary, reasonably assure the provision of the capability described in subsection (a) for a period of six years, beginning as soon as practicable in order to minimize any interruption of data availability;

(3) shall terminate one year after the expiration of the six-year period described in paragraph (2);

(4) may, subject to section 305 of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 255), provide for a payment by the Secretary to cover a portion of the capital cost of providing such capability, which may be paid in installments (A) based on progress prior to the beginning of the six-year

period described in paragraph (2), and (B) the sum of which shall be less than the total cost of procuring the system required to assure the capability for six years;

(5) shall provide that sale of digital remote-sensing data shall be in accordance with the provisions of section 303 of this title;

(6) shall not provide for any guaranteed data purchases by the Federal Government; and

(7) may provide that the contractor utilize, on a space-available basis, civilian Government satellites as platforms for a civil remote-sensing satellite system, if—

(A) the contractor immediately reimburses the Government for all related costs incurred with respect to such utilization, including a reasonable and proportionate share of fixed, spacecraft, data transmission, and launch costs; and

(B) such utilization would not interfere with or otherwise in any way compromise the intended civilian Government missions, as determined by the agency responsible for the civilian satellite.

(c) The contract authorized by subsection (a) shall be awarded on the basis of—

(1) the cost to the Government of the payment under subsection (b)(4);

(2) the reliability, technical competence, and financial condition of the contractor;

(3) the contractor's ability to develop the remote-sensing data market;

(4) the contractor's ability to supplement basic capabilities specified in section 302(a) by adding remote-sensing capabilities (at the contractor's expense and consistent with national security concerns) which maintain United States leadership in remote-sensing;

(5) the contractor's ability to meet the conditions for obtaining a license under title IV;

(6) the contractor's ability to provide digital remote-sensing data on a timely and reliable basis;

(7) the contractor's ability to effect a smooth transition with any contractor selected under title II;

(8) the royalty or profit- or revenue-sharing arrangement, or other such financial consideration offered to the Federal Government; and

(9) such other factors as the Secretary deems appropriate.

(d) If, as a result of the competitive process required by subsection (a), the Secretary receives no proposal which he finds acceptable under the conditions of this Act, the Secretary shall so certify and fully report his findings to the Congress. Thirty days after so certifying and reporting, the Secretary may reopen the competition. If no acceptable proposals are received after such subsequent competition, or if the Secretary decides not to reopen the competition, the Secretary shall so certify and fully report his findings to the Congress. Ninety days after so certifying and reporting, the Secretary is authorized to assure MSS data continuity by procurement and operation by the Federal Government of the necessary systems, subject to the availability of appropriations therefor. Such procurement and operation may include generation of data of a higher quality than MSS data.

SALE OF DATA

SEC. 303. (a) The contractor selected under section 302 shall sell data in accordance with the provisions of sections 601 and 602 of this Act.

(b) Any sale of digital remote-sensing data by the contractor to Federal agencies shall be on a nondiscriminatory basis, with the additional condition that at least 5 per centum of the price of each such sale shall be rebated to the Government (and thereby reduce the total net cost to the Government) as a royalty payment to the United States Treasury. Such royalty payments shall be required during the life of the contract authorized in section 302, or until such time as the cumulative total of such royalty payments equals the value of any payment made to the contractor by the Government under section 302(b)(4), whichever first occurs. Data sales to non-Federal buyers shall not be subject to such a rebate.

(c) After the six-year period described in section 302(b)(2), the contractor may continue to sell data and, if licensed under title IV of this Act, to operate a civil remote-sensing space system.

REPORT

SEC. 304. Two years after the date of the commencement of the six-year period described in section 302(b)(2) the Secretary shall report to the President and to the Congress on the progress of the transition to fully private financing, ownership, and operation of remote-sensing space systems, together with any recommendations for actions, including actions necessary to ensure United States leadership in civilian land remote-sensing from space.

TITLE IV—LICENSING OF PRIVATE REMOTE-SENSING SPACE SYSTEMS

GENERAL AUTHORITY

SEC. 401. The Secretary is authorized, after consultation with other appropriate Federal agencies, to grant, suspend, modify, or revoke licenses under this title, and to take any other such actions as he deems necessary in order to carry out the provisions of this title.

CONDITIONS FOR OPERATION

SEC. 402. (a) No private sector party may operate any remote-sensing space system which is subject to the jurisdiction or control of the United States (as determined by the Secretary) without a license pursuant to section 403.

(b) Any license issued pursuant to section 403 shall be subject to the following conditions:

(1) The system shall be operated in such manner as to preserve and promote the national security of the United States and to observe and implement the international obligations of the United States.

(2) Digital remote-sensing data shall be made available to all potential users on a nondiscriminatory basis.

(3) No license issued under this title shall protect the licenseholder from fair competition from other licenseholders.

(4) Any private sector party proposing to be licensed under section 403 shall agree, as a condition for the receipt of such license, that prior to disbanding or terminating operations under the license, the licenseholder will make disposition of any orbiting satellites in a manner satisfactory to the President.

(5) Any private sector party proposing to be licensed under section 403 shall agree, as a condition for

the receipt of such license, to provide to the Secretary any data generated under such license which the Secretary may request for the purpose of archiving pursuant to section 602.

(6) For the purposes of ensuring compliance with the provisions of this Act concerning nondiscriminatory access to data, any private sector party proposing to be licensed under section 403 shall agree, as a condition for the receipt of such license—

(A) to notify the Secretary of any "value-added" activities (as defined by the Secretary by regulation) that will be conducted by the licensee or by a subsidiary or affiliate of the licensee; and

(B) to provide the Secretary with a plan for the conduct of such activities which will ensure compliance with such provisions concerning nondiscriminatory access.

AUTHORITY OF THE SECRETARY

SEC. 403. (a) The Secretary is authorized to license qualified private sector parties to operate civil remote-sensing space systems in accordance with the provisions of this Act.

(b) Any license issued under subsection (a) shall be in effect for such period as the Secretary may specify.

(c) Any private sector party may apply to the Secretary for issuance, transfer, or termination of a license under this title in a form and manner prescribed by the Secretary. Each application under this section shall set forth the activities proposed to be carried out under the license, including measures taken to comply with those operating requirements specified in section 402 of this Act.

(d) No license shall be granted by the Secretary unless he determines in writing that the applicant will comply with the requirements of this Act, the regulations issued pursuant to this Act, and the international obligations and national security concerns of the United States. The Secretary shall review any application and make a determination thereon within one hundred and twenty days of the receipt of an application. If final action has not occurred within such time, the Secretary shall inform the applicant of any pending issues and of actions required to resolve them.

(e) The Secretary may revoke, suspend, or modify a license issued under this title if the Secretary determines and notifies the licensee in writing that the licensee has substantially failed to comply with any provision of this Act, with any regulation issued under this Act, with any terms, conditions, or restrictions of such license, or with any international obligation or national security concern of the United States.

(f) Any applicant or licensee who makes a timely request for review of a denial of issuance or transfer; revocation; suspension; conditioning; or modification of a license shall be entitled to adjudication by the Secretary on the record after an opportunity for an agency hearing with respect to such denial, revocation, suspension, conditioning, or modification. Any final action by the Secretary under this subsection shall be subject to judicial review under chapter 7 of title 5, United States Code.

REGULATORY AUTHORITY OF THE SECRETARY

SEC. 404. (a) The Secretary may issue regulations to carry out the provisions of this title.

(b) Regulations issued by the Secretary under this title shall be promulgated only after public notice and comment in accordance with the provisions of section 553 of title 5, United States Code.

ENFORCEMENT AUTHORITY OF THE SECRETARY

SEC. 405. (a) Each license issued by the Secretary shall require the licensee—

(1) to allow the Secretary or his designated officers to inspect any financial or business records associated with remote-sensing or "value-added" activities, and

(2) to allow the Secretary or his designated officers to inspect any space-related or ground segment hardware or software to be utilized by the licensee in remote-sensing activities.

(b) It is unlawful for any person to violate any regulation or provision of any license issued under this Act, to violate any space treaty or law implementing any space treaty, or to prevent or inhibit the monitoring of remote-sensing activities or "value-added" activities by the Secretary or his designated officers.

(c) Any person who after notice and opportunity to be heard in accordance with title 5, United States Code, is found by the Secretary to have committed any act prohibited by subsection (b) shall be liable for a civil penalty of not more than $10,000 for each violation. Each day of continuing operation in violation shall constitute a separate violation. The Secretary may compromise, modify, or remit any such civil penalty.

(d) For the purpose of conducting any hearing under this section, the Secretary may issue subpenas for any materials, documents, or records, or for the attendance and testimony of witnesses.

(e) In carrying out his enforcement responsibilities, the Secretary may—

(1) seize any object, record, or report where it reasonably appears that such was used, is being used, or is likely to be used in violation of this Act; or

(2) make investigations and inquiries and administer to or take from any person an oath affirmation or

affidavit concerning any matter relating to the enforcement of this Act.

(f) The Secretary is authorized to terminate any licensed operations on an immediate basis when it reasonably appears that operation in violation of any provision of this Act, or any provision of a license issued under this Act, or of any obligation of the United States under a space treaty, would be detrimental to the national interest.

AGENCY ROLES

SEC. 406. (a) A private sector party may apply for a license to operate a remote-sensing space system which utilizes, on a space-available basis, a civilian United States Government satellite or vehicle as a platform for such system.

(b) The Secretary, pursuant to the authorities of this title, may license such system if it meets all conditions of this Act, and if—

(1) the applicant agrees, as a condition for the receipt of such license, to reimburse the Government immediately for all related costs incurred with respect to such utilization, including a reasonable and proportionate share of fixed, spacecraft, data transmission, and launch costs; and

(2) such utilization would not interfere with or otherwise compromise the intended Government mis-

sions, as determined by the agency responsible for the satellite or vehicle.

(c) The Secretary may offer assistance to private sector parties in finding appropriate opportunities for such utilization.

(d) Federal agencies are authorized to enter into agreements for such utilization if such agreements are consistent with the agency's mission, statutory authority, and appropriation Acts, and if such remote-sensing space system is licensed by the Secretary.

(e) The provisions of this section do not apply to activities carried out pursuant to title V.

TERMINATION

SEC. 407. If, five years after the expiration of the six-year period described in section 302(b)(2), no private sector party has been licensed and continued in operation under the provisions of this title, the authority of this title shall terminate.

TITLE V—RESEARCH AND DEVELOPMENT

PURPOSE AND POLICY

SEC. 501. It is the purpose of this title to provide for a comprehensive civilian program of research, development, and demonstration to enhance the United States capabilities for remote-sensing from space, as well as to enhance the application and utilization of such capabilities.

CONTINUED FEDERAL RESEARCH AND DEVELOPMENT

SEC. 502. (a)(1) The Administrator of the National Aeronautics and Space Administration is directed to continue and to enhance such Administration's programs of remote-sensing research and development.

(2) The Administrator is authorized and encouraged to—

(A) conduct experimental space remote-sensing programs (including applications demonstration programs and basic research at universities);

(B) develop remote-sensing technologies and techniques, including those needed for monitoring the Earth and its environment; and

(C) conduct such research and development in cooperation with other public and private research entities, including private industry, universities, State and local governments, foreign governments, and international organizations, and to enter into arrangements (including joint ventures) which will foster such cooperation.

(b)(1) The Secretary shall conduct a continuing program of—

(A) research in applications of remote-sensing;

(B) monitoring of the Earth and its environment; and

(C) development of technology for such monitoring.

(2) Such program may include support of basic research at universities.

(3) The Secretary is authorized and encouraged to conduct such research, monitoring, and development in cooperation with other public and private research entities, including private industry, universities, State and local governments, foreign governments, and international organizations, and to enter into arrangements (including joint ventures) which will foster such cooperation.

(c) Other Federal agencies are authorized and encouraged to conduct research and development on the use of remote-sensing in fulfillment of their authorized missions, using funds appropriated for such purposes.

(d) The Secretary and the Administrator of the National Aeronautics and Space Administration shall, within one year after the date of enactment of this Act and biennially thereafter, jointly develop and transmit to the Congress a report which includes (1) a unified national plan for remote-sensing research and development applied to the Earth and its atmosphere; (2) a compilation of progress in the relevant ongoing research and development activities of the Federal agencies; and (3) an assessment of the state of our knowledge of the Earth and its atmosphere, the needs for additional research (including research related to operational Federal remote-sensing space programs), and opportunities available for further progress.

USE OF EXPERIMENTAL DATA

SEC. 503. Data gathered in Federal experimental space remote-sensing programs may be used in related research and development programs funded by the Federal Government (including applications programs) and cooperative research programs, but not for commercial uses or in competition with private sector activities, except as permitted by section 504.

SALE OF EXPERIMENTAL DATA

SEC. 504. Data gathered in Federal experimental space remote-sensing programs may be sold en bloc through a competitive process (consistent with national security interests and international obligations of the United States) to any United States entity which will market the data on a nondiscriminatory basis.

TITLE VI—GENERAL PROVISIONS

NONDISCRIMINATORY DATA AVAILABILITY

SEC. 601. (a) Any digital remote-sensing data generated by any system operator under the provisions of this Act shall be made available to all users on a nondiscriminatory basis in accordance with the requirements of this Act.

(b) Any system operator shall make publicly available the prices, policies, procedures, and other terms and conditions (but not, in accordance with section 104(3)(C), the names of buyers or their purchases) upon which the operator will sell such data.

ARCHIVING OF DATA

SEC. 602. (a) It is in the public interest for the United States Government—

(1) to maintain an archive of land remote-sensing satellite data for historical, scientific, and technical purposes, including long-term global environmental monitoring;

(2) to control the content and scope of the archive; and

(3) to assure the quality, integrity, and continuity of the archive.

(b) The Secretary shall provide for long-term storage, maintenance, and upgrading of a basic, global, land remote-sensing data set (hereafter referred to as the "basic data set") and shall follow reasonable archival practices to assure proper storage and preservation of the basic data set and timely access for parties requesting data. The basic data set which the Secretary assembles in the Government archive shall remain distinct from any inventory of data which a system operator may maintain for sales and for other purposes.

(c) In determining the initial content of, or in upgrading, the basic data set, the Secretary shall—

(1) use as a baseline the MSS data currently archived;

(2) take into account future technical and scientific developments and needs;

(3) consult with and seek the advice of users and producers of remote-sensing data and data products, keeping the Congress advised of such contacts;

(4) consider the public's need for data which may be duplicative in terms of geographical coverage but which differ in terms of season, spectral bands, resolution, or other relevant factors;

(5) include, as the Secretary deems appropriate, digital remote-sensing data generated either by the Landsat system, pursuant to title III, or by license holders under title IV; and

(6) include, as he deems appropriate, data collected by foreign ground stations or by foreign remote-sensing space systems.

(d) All original data (or copies thereof) shall, on request, be made promptly available to the Secretary by any system operator in a form suitable for processing for data storage, maintenance, and access. The Secretary is authorized (subject to the availability of appropriations) to pay to such system operator reasonable costs for reproduction and transmittal of any such data.

(e) Any system operator shall have the exclusive right to sell all data that the operator provides to the United States remote-sensing data archive for a period to be determined by the Secretary but not to exceed ten years from the date the data are sensed. In the case of data generated from the Landsat system prior to the implementation of the contract described in section 201(a) of this Act, any contractor selected pursuant to section 201 shall have the exclusive right to market such data on behalf of the United States Government for the duration of such contract. A system operator may relinquish his exclusive right and consent to distribution from the archive before the period of exclusive right has expired by terminating his offer to sell particular data.

(f) After expiration of such exclusive right to sell, or after relinquishment of such right, the data provided to the United States remote-sensing data archive shall be in the public domain and shall be made available to requesting parties by the Secretary at prices reflecting reasonable costs of reproduction and transmittal.

(g) In carrying out the functions of this section, the Secretary may use existing facilities or may contract with a private sector party or parties for the performance of such functions, subject to the availability of appropriations therefor.

NONREPRODUCTION

SEC. 603. Digital remote-sensing data distributed by any system operator under the provisions of this Act may be sold under the condition that such data will not be reproduced or disseminated by the purchaser.

REIMBURSEMENT FOR ASSISTANCE; SALE OF EQUIPMENT

SEC. 604. (a) The Administrator of the National Aeronautics and Space Administration, the Secretary of Defense, and the heads of other Federal agencies are authorized to provide assistance to system operators under the provisions of this Act. Substantial assistance, such as launch services, shall be reimbursed by the system operator.

(b) The Secretary may allow a licensee under section 403, or any other private sector party, to buy or otherwise acquire the use of equipment from the Landsat system, when such equipment is no longer needed for the operation of that system or for the sale of data from that system. Officials of other Federal civilian agencies are authorized and encouraged to cooperate with the Secretary in carrying out this subsection.

RADIO FREQUENCY ALLOCATION

SEC. 605. The Federal Communications Commission and the Secretary are encouraged to allocate to any license holder under title IV of this Act access to Government radio frequencies and other civil radio frequencies appropriate for space remote-sensing systems in a timely manner consistent with international obligations and with the national interest.

CONSULTATION

SEC. 606. (a) The Secretary shall consult with the Secretary of Defense on all matters under this Act affecting national security. The Secretary of Defense shall be responsible for determining those conditions, consistent with this Act, necessary to meet national security concerns of the United States and for notifying the Secretary promptly of such conditions.

(b)(1) The Secretary shall consult with the Secretary of State on all matters under this Act affecting international obligations. The Secretary of State shall be responsible for determining those conditions, consistent with this Act, necessary to meet international obligations and policies of the United States and for notifying the Secretary promptly of such conditions.

(2) The Secretary of State is authorized and encouraged to provide land remote-sensing data, technology, and training to developing nations as a component of programs of international aid.

(3) The Secretary of State shall promptly report to the Secretary any instances outside the United States of discriminatory distribution of data.

(c) If, as a result of conditions imposed on a system operator on the basis of national security or international obligations or policies, the Secretary (in consultation with the Secretary of Defense or the Secretary of State, as the case may be) determines that additional costs will be incurred by the system operator, or that past development costs (including the cost of capital) will not be recovered by the system operator, the Secretary may require the agency or agencies requesting such conditions to reimburse the system operator for such additional or development costs, excluding anticipated profits.

AMENDMENT TO NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION, 1983

SEC. 607. Subsection (a) of section 201 of the National Aeronautics and Space Administration Authorization, 1983, is amended to read as follows:

"(a) The Secretary of Commerce is hereby authorized to plan and provide for the management and operation of civil remote-sensing space systems, which may include the Landsat 4 and 5 satellites and associated ground system equipment transferred from the National Aeronautics and Space Administration; to provide for user fees; and to plan for the transfer of the ownership and operation of civil, operational remote-sensing space systems to the private sector when in the national interest.".

RELATION TO OTHER LAWS

SEC. 608. The requirements of this Act are in addition to, and not in lieu of, any other provision of law.

AUTHORIZATION OF APPROPRIATIONS

SEC. 609. (a) There are authorized to be appropriated to the Secretary $10,000,000 for fiscal year 1985 for the purpose of carrying out the provisions of section 302, title IV, and section 602 of this Act.

(b) The authorization provided for under subsection (a) shall be in addition to moneys authorized pursuant to title II of the National Aeronautics and Space Administration Authorization Act of 1983 (Public Law 97–324).

TITLE VII—PROHIBITION OF COMMERCIALIZATION OF WEATHER SATELLITES

PROHIBITION

SEC. 701. Neither the President nor any other official of the Government shall make any effort to lease, sell, or transfer to the private sector, commercialize, or in any way dismantle any portion of the weather satellite systems operated by the Department of Commerce or any successor agency.

FUTURE CONSIDERATIONS

SEC. 702. Regardless of any change in circumstances subsequent to the enactment of this Act, even if such change makes it appear to be in the national interest to commercialize weather satellites, neither the President nor any official shall take any action prohibited by section 701 of this Act unless this title has first been repealed.

ASTRO

Dr. Radford Byerly
Science Consultant
Subcommittee on Space Science and Applications
Rayburn House Office Building - Room 2321
Washington, D.C. 20515

March 2, 1984

Dear Dr. Byerly,

I appreciate your forwarding to us of the most recent version of the Bill currently under consideration "to establish a system to promote the use of land remote-sensing satellite data, and for other purposes". As you are most likely aware, RCA has been interested in the commercialization of earth remote sensing for some time and at present, we are in the process of responding to the recent request for proposal issued by the Department of Commerce on this topic.

We have reviewed the most recent version of the legislation and find it to include a significant clarification on some of the key issues that were not totally resolved in earlier drafts. Probably the most significant of these is the definition of "on a non-discriminating basis".

As currently defined (in section 104),we believe a commercial enterprise will be allowed to develop in a manner fair and equitable to all parties and we urge that this definition not be modified in any future draft revisions.

One additional point that I would like to stress, probably the most significant at this time, is the urgency with which final legislation is required. Now that Landsat-D has been launched, a delay in the authorization for the Department of Commerce to proceed would amplify greatly the probability of interruption of data during the transition phase. Furthermore, DOC will soon have industry responses to their RFP and enabling legislation will then be required to proceed. Great progress has obviously been made

RCA

in recent months and we urge you to keep up the pace with the goal of having legislation in place by the end of May so the transition process can continue smoothly.

Thank you for the opportunity to comment on this important issue.

Sincerely,

C. A. Schmidt
Division Vice President
and General Manager

SPACE AMERICA
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March 9, 1984

Honorable Don Fuqua, Chairman
Committee on Science and Technology
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Space America is extremely grateful for the opportunity to testify in support of the draft version of H.R. 4836, the "Land Remote Sensing Commercialization Act of 1984." During our testimony, we explained the difficulties Space America has encountered trying to obtain private sector financing for its commercial land remote sensing program in the absence of authorizing legislation to resolve the policy issues surrounding commercialization. Your Committee Members and staff are to be commended for working so swiftly to develop H.R. 4836, which resolves these issues--and thus encourages U.S. companies to develop the land remote sensing business early, to solve the data gap problem, and to maintain the U.S. competitive edge over foreign systems.

Space America continues to support H.R. 4836 and urges the Committee to maintain the basic framework for commercialization as outlined in the bill. The Request for Proposals (RFP) warned potential bidders that Congress must approve any contract award by the Secretary of Commerce and stated that Congressional concerns should be reflected in each bid. Since the RFP specifically cited your draft version of H.R. 4836, Space America, and presumably other bidders, has spent significant amounts of time and money to develop a proposal that abides by the requirements of your bill. The proposals are due next Monday. Bidders therefore can no longer accommodate significant changes in the legislation. Major changes, such as a change in the data baseline, would influence system design, drive up costs, and lengthen construction schedules significantly. Such a change therefore might discourage some bidders and adversely affect the commercialization process. At issue is whether the next system is to be a R&D-technology-driven system, or a commercial, operational, market-driven system. Space America has market analyses demonstrating that a market-driven system design is required if a land remote sensing business expects to become profitable, and that many users wish to continue to use 80-meter data as the "workhorse." The market for lower resolution data is as yet totally unproven. We strongly urge that you not change H.R. 4836 to restrict system design.

Two recent Congressionally requested reports, OTA's "Remote Sensing and the Private Sector" and GAO's "The Effects on Users of Commercializing Landsat and the Weather Satellites," point out some of the issues that needed to be resolved prior to a decision on Landsat commercialization. We believe that H.R. 4836 ensures that the potential problems identified in these reports will not occur. Its various provisions, particularly oversight, ensure that: national security concerns and international commitments are met; data continues to be distributed on an open and non-discriminatory basis; university and government research programs continue to maintain U.S. leadership in this field; and foreign, governmental, and private sector users, including the value-added industry, are protected from unfair prices and practices. H.R. 4836 provides an appropriate balance between the financial interests of the potential private operators and the concerns of international, federal, and non-federal users identified in reports.

Comments on the OTA and GAO reports and on H.R. 4836 have been requested prior to your Subcommittee and full Committee mark-up. Space America's technical comments on the bill are attached.

Again, thank you for inviting our participation in the process.

Sincerely,

Donald K. (Deke) Slayton
President
Space Services, Inc.
of America

Diana H. Josephson

Diana H. Josephson
President
Space America

Attachment
cc: Members, Committee on Science and Technology

Technical Comments

Sec. 104 (4), page 7, lines 7-10, Delete.

The language implies continued government ownership which might discourage investors.

Sec. 301 (a) (2) and (b) (1) and (2). Do not change.

A change in the data baseline might impose substantial additional costs, and would lengthen the construction schedule.

Sec. 302 (b) (4), page 13, line 18, insert after the word "installments" and before "(A)", the following language, "for which he may take an equity interest in the contractor".

A clarification that the U.S. government can take an equity ownership interest in the contractor in exchange for the government payment to the contractor. The suggested language change may not be required in the bill if the report language reflects its intent.

Sec. 302 (b) (7), page 14, lines 7-11. Do not delete.

The government should be reimbursed by the private sector for its proportionate share of all U.S. Government costs incurred through use of Government satellites etc.

Sec. 303 (b), page 16, line 14, delete "as a royalty payment"; line 15, delete "such royalty payments"; line 17, delete "such royalty payments" and insert in lieu thereof, "such rebates".

The government does not hold title to the Title III system so it is inappropriate to use the term "royalties" when referring to the rebated monies paid by the system owner to the Government.

Sec. 602 (d), page 28, line 7, insert after the ")" and before "shall", the following language," that have been acquired by the system operator".

The system operator should receive reimbursement at regular rates if the Secretary requests data for the national archive which requires special acquisition or preprocessing of data.

The Geosat
Committee, Inc.

March 12, 1984

The Honorable Don Fuqua
U.S. HOUSE OF REPRESENTATIVES
2269 RHOB
Washington, DC 20515

Dear Congressman Fuqua:

Over the last eight years The Geosat Committee has followed the process of the U.S. government reaching a decision regarding the ultimate commercialization of land remote sensing satellite systems. Having testified over a dozen times on behalf of the Committee in both the House and the Senate subcommittees on space, we were very pleased to review HR4836, the "Land Remote Sensing Commercialization Act of 1984".

Over the past several years, The Geosat Committee has firmly supported long-term continuity of a government and/or private sector land observation satellite system in the United States. We have strongly advocated long-term continued government support for exploratory R&D for remote sensing systems and applications so that the United States may remain competitive with the rest of the world. The U.S. will always be dependent on access to global non-renewable resources and the demonstrated potential of the use of satellite remotely sensed data in helping us to better understand these global resources and their accessibility is of great importance. The Geosat Committee champions continued U.S. leadership of the international "Open Skies" policy; that is, non-discriminatory access to fundamental data on a timely basis. Having been instrumental in the inclusion of the 2.2 micron band on the Thematic Mapper and having studied its use in the joint NASA-Geosat Test Case Program, we vehemently believe that the continuation of a TM-type system is of paramount importance in the next decade.

The Board of Directors of The Geosat Committee, cognizant of the development of the Source Evaluation Board/U.S. Department of Commerce Request For Proposal (RFP), reviewed the current House bill and was pleased to see that HR4836 closely approximates the thrust of the Administration's RFP. Geosat

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can strongly support HR4836 as presented to us on Feb. 9, 1984, if one fundamental change is made. We, with many others, take issue with establishing the obsolete MSS 1960's technology and data as the technical baseline in the Bill. Proposals for follow-on Landsat systems beyond LANDSAT-5/TM strongly indicate the baseline can be a "TM-type" system which can be variously processed either onboard or on the ground to provide users with either MSS, TM, or better data in the future. As a scanning system the TM is a quantum step forward over the MSS in data acquisition and information potential. It, too, however, is rapidly going out-of-date with the advent of develpments in Multi-Linear Array (MLA) technology, which is evolving both in the U.S. and in other nations, with work towards a space system developing most rapidly outside the U.S. where MLA technology will be incorporated in a space system towards the end of this decade. We believe and strongly urge that your Bill should be amended to establish "TM-like" data as the baseline for future U.S. civil land remote sensing satellites.

After eight years, it is exciting to see the Administration, the House, and the Senate apparently converging on sensible legislation which will enable commercialization decisions to proceed in an orderly manner. Recognizing the short time we have in the current session in an election year, with the provision above we support HR4836 and wish you success in bringing this Bill to a positive vote, along with a successful Bill in the Senate, to be sent to the Administration and help solve intelligently the commercialization program to serve the best interests of this country.

Respectfully yours,

Frederick B. Henderson III

Frederick B. Henderson III, Ph.D.
President

cc: Malcolm Baldrige, Secretary, U.S. DEPARTMENT OF COMMERCE
John Byrne, Administrator, NOAA
Slade Gorton, U.S. SENATE

The Board of Directors of The Geosat Committee (list appended)

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** Chairman

1984 Board of Directors
The Geosat Committee

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Geosat®
The Geosat
Committee, Inc.

March 12, 1984

The Honorable Malcolm Baldrige
US DEPARTMENT OF COMMERCE
HCHB 5851
Washington DC 20230

Dear Mr. Secretary:

The Geosat Committee has followed the activities of the Civil Observational Remote Sensing Satellite Advisory Committee (CORSSAC) closely, and reviewed the recommendations made by that Committee at its January 26-27, 1984 meeting at our Board of Directors meeting on Feb. 3, 1984.

Over the past several years, The Geosat Committee has firmly supported long-term continuity of a government and/or private sector land observation satellite system in the United States. We have strongly advocated long-term continued government support for exploratory R&D for remote sensing systems and applications so that the United States may remain competitive with the rest of the world. The United States will always be dependent on access to global non-renewable resources and the demonstrated potential of the use of satellite remotely sensed data in helping us to better understand these global resources and their accessibility is of great importance. The Geosat Committee champions continued U.S. leadership of the international "Open Skies" policy; that is, non-discriminatory access to fundamental data on a timely basis. Having been instrumental in the inclusion of the 2.2 micron band on the Thematic Mapper and having studied its use in the joint NASA-Geosat Test Case Program, we vehemently believe that the continuation of a TM-type system is of paramount importance in the next decade.

The Geosat Committee Board of Directors voted unanimously to support the four recommendations made by CORSSAC on January 26-27, 1984 (appended). We feel all four recommendations are of vital importance to the United States, but wish to emphasize the importance of establishing the provision of "TM-like" data as a baseline for future land observational satellite systems.

We wish you the utmost success in the task before you during this phase of the commercialization process. We implore you to continue Landsat-type programs through support of early budgeting for LANDSAT-D" (LS-6) lead items, as well as continuation of a government program should, for whatever reason, the commercialization process fail in 1984.

Respectfully yours,

Frederick B. Henderson III

Frederick B. Henderson III, Ph.D.
President

cc: Mr. John Byrne
Congressman Don Fuqua
Senator Slade Gorton

The Geosat Committee Board of Directors (list appended)

Recommendations of the Civil Operational
Remote Sensing Satellite Advisory Committee
January 26-27, 1984 Meeting

If the best interests of our citizens are to be served, the Committee believes, without reservation, that the United States Government must commit itself to the continuity of a Governmental or private sector civil land remote sensing system. This conviction stems not only from the role remote sensing technology plays in enhancing the economic base of the country, but also from the pervasive influence such information will have on improving the future quality of life on earth.

THE RECOMMENDATIONS OF THE COMMITTEE ARE AS FOLLOW:

1. In the light of non-Federal user requirements for global data of higher spectral and spatial resolutions than the Multispectral System (MSS), because no U.S. commercial satellite system will succeed unless it provides data commercially competitive in the world marketplace, and in view of the fact that higher resolution data can be resampled to meet MSS user requirements, the Government must insure that there is no interruption in acquisition, distribution, and archiving of, at a minimum, "Thematic mapper-like" (TM-like)* data. In this regard, whether commercialization is achieved or not, it is vital to the national interest that "TM-like" data be continuously acquired until better systems are developed. This should be an important factor in your evaluation of the responses to the RFP.

2. It is vital for the United States to remain competitive in the international marketplace and to investigate critical global environmental problems. Therefore, we believe that the Government must provide, or cause to be provided, aggressive and long-term exploratory research and development in civil remote sensing.

3. It is imperative that the United States continue its policy of timely and non-discriminatory data access at equitable prices.

4. The Government must provide, or cause to be provided, a national archive of all previously acquired and future acquired civil land satellite data so long-term changes in global environments can be evaluated by present and future generations.

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* Currently, "TM-like" data are data acquired synoptically over swaths greater than 100km; data acquired in a sun-synchronous manner with illumination conditions similar to those of Landsat; data acquired with 3 bands in the visible, 3 bands in the reflected infrared, and one band in the thermal infrared; data required at a resolution of 30 meters in all but the thermal band and 120 meters in the thermal band. Bandpasses, radiometric sensitivity, geometric fidelity, etc., to be within a few percent of the characteristics of the present TM system.

* MEMBER, EXECUTIVE COMMITTEE
** CHAIRMAN

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Terra-Mar

RECEIVED
MAR 21 1984
COMMITTEE ON SCIENCE
AND TECHNOLOGY

March 19, 1984

The Honorable Don Fuqua
U.S. House of Representatives
Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Fuqua:

I recently sent a letter to Dr. William Bishop of the Source Evaluation Board for Civil Space Remote Sensing with some comments on the Landsat RFP process and the Landsat legislation currently pending in both the Senate and House of Representatives. That letter, a copy of which is enclosed for your information, summarizes my major concerns regarding the precipitous pace of satellite remote sensing commercialization and the deficiencies in that process.

I believe remote sensing technology has significant commercial potential, but not in the context of the government's past and present mode of operating the Landsat system. To structure an RFP and associated legislation in order to maintain the status quo is to relegate the commercialization of remote sensing to failure. In my opinion, the relevant legislation should address the transition of current Landsat assets to private operation while providing specific guidelines and incentives for all entities who may choose to enter either the data acquisition segment or the data marketing aspect of remote sensing in the future.

There are many organizations outside the existing family of Landsat contractors, subcontractors, and government managers who are skilled and experienced in this field, but who are not prepared at this time to submit a competitive proposal. Thus, monopoly status should not be granted to the winner of the current RFP process. Rather, incentives (such as tax credits) should be established to attract the most aggressive and competitive companies to this new industry as they become better positioned. Market competition should ultimately decide which companies are best suited to be the industry leaders.

If Congress is unwilling to adopt such a "leap of faith" perspective on the commercial potential of remote sensing technology or to trust the strength of the free market system, then it should appropriate funds for Landsat D''/6 -- with the understanding that the first commercial entity to provide equal or better "TM quality" data from its own system will inherit the government market. Such a strategy is completely consistent with the guidelines set forth in OMB Circular A-76.

I would be happy to follow up on the testimony I presented before the Joint Subcommittee Hearing last November or to respond to your inquiries and thoughts on this subject as necessary. Indeed, although time may limit much additional discussion or debate, Congress must be careful not to limit the ability of U.S. companies to compete internationally in this promising area due to poorly structured domestic legislation.

Thank you for your attention and your consideration of this matter.

Sincerely yours,

Donn C. Walklet
President

DCW:ath
Enclosure

Terra-Mar

March 15, 1984

Dr. William Bishop
Source Evaluation Board for Civil
Space Remote Sensing
U.S. Department of Commerce
Rockville, MD 20852

Dear Dr. Bishop:

As an interested and concerned observer of the current Landsat RFP process, I would like to make a few comments regarding the forthcoming evaluation of proposals.

As I believe you know, my company, Terra-Mar, has been active in evaluating commercial opportunities in remote sensing and related earth resources information services. Based upon eight years of research, we have decided to aggressively implement a commercial project of our own. However, our initiative is based on the assumption that Landsat 5 Thematic Mapper data as well as data from other sensors will be available in the future. As a function of organizing this project, I have either interacted with, or sought impartial evaluations concerning the capabilities of, the most likely bidders on the Landsat RFP.

Unfortunately, these potential major players seem to be bypassing, and even ignoring, commercial strategies which would best serve the long term market development of remote sensing technology. In some cases a government contractor "business as usual" mentality prevails and, in another situation, there appears to be a complete lack of undertanding of appropriate financing and marketing techniques, especially in the context of the rapidly changing information technology that will be involved in Landsat data processing. What particularly concerns me is the probability that none of the proposals will really satisfy the need for creative commercial solutions.

You have probably noticed that there are few bidders outside the mainstream of past Landsat operations and contracts. It appears to me that some of the best potential players are sitting on the sidelines confounded by the politics of this situation. Thus, I fear that the innovative management and marketing skills which could be brought to remote sensing data market development will be lost if the evaluation criteria currently contained in the RFP are strictly applied.

In this context, I would like to make four important points. First, I strongly suggest that in its evaluation of proposals the SEB place particular emphasis on those criteria that pertain to the technical qualifications of respective bidders, in particular their ability to build on and advance current Thematic Mapper based technology.

Second, I hope the SEB will recommend to the Secretary of Commerce that marketing of Landsat data, beyond the basic wholesale operation suggested by Russ Koffler, be permitted by all commercial entities willing to exercise a more creative and aggressive posture in market development. In other words, the chosen commercial entity should be restricted to wholesaling the raw data to any organization possessing the cability to process it (i.e., the commercial equivalents to Sioux Falls), as well as to market and distribute it. I make this latter point based on both my knowledge of marketing and my personal business interests.

Third, such a division between the operation of the space segment and the marketing of the data would be consistent with the CORSSAC recommendations as presented to the Secretary.

As a fourth and final point, I suggest the SEB recommend that any incentives, beyond the current operation of Landsat 5, should be made available to all future entities who qualify to operate under the satellite licensing criteria as proposed by both the House and Senate Landsat legislation. Indeed, in the long term, the marketplace should decide which commercial entity (or entities) is best qualified to operate future commercial remote sensing satellite systems. The door should be left open for other commercial entities, in addition to the winning bidder, to address data acquisition -- the current process should not be allowed to lead to the setting up of a monopoly.

Although I realize that your discretionary powers to change the RFP evaluation criteria and policy are limited, your recommendations to the Secretary, in consideration of the quality of the proposals, can significantly impact the direction of future satellite remote sensing initiatives. Lastly, in light of the diligence and dedication of the SEB in the past to this issue, I would like to commend you and your staff for your efforts and wish you well in your pending deliberations.

Sincerely yours,

Donn C. Walklet

Donn C. Walklet
President

DCW:ath

cc: Malcolm Baldrige, Secretary of Commerce
George Brown, Jr., U.S. House of Representatives
Anthony Calio, Department of Commerce
Craig Fuller, The White House
Don Fuqua, U.S. House of Representatives
Slade Gorton, U.S. Senate
Michel Halbouty, CORSSAC
Ernest Hollings, U.S. Senate
George Keyworth, OSTP
John McElroy, Department of Commerce
Robert Packwood, U.S. Senate
James Scheuer, U.S. House of Representatives
Harold Volkmer, U.S. House of Representatives

TESTIMONY

OF

KLAUS P. HEISS
SPARX Corporation

U.S. House of Representatives Committee on Science and Technology

Subcommittee on Space Science and Applications

and

Subcommittee on Natural Resources, Agriculture
Research and Environment

March 22, 1984

March 22, 1984

The Honorable Donald Fuqua
Chairman
House Committee on Science and Technology
2269 Rayburn Building
Washington, DC 20510

Re: H.R. 4836
"To establish a system to promote the use of land remote-sensing satellite data, and for other purposes"

Dear Mr. Chairman:

This is in response to your invitation to comment on the draft of H.R. 4836 "To establish a system to promote the use of land remote-sensing satellite data, and for other purposes".

SPARX is a U.S., State of Delaware corporation with 60 percent U.S. ownership and significant (40 percent) European ownership, dedicated--among other objectives--to flying the first commercial remote sensing demonstration mission on Space Shuttle Flight 41G scheduled for August, 1984. My own involvement in matters of Landsat dates back to 1968 (Rangeland management), 1973 (Landsat-C approval) and 1974 (Thematic Mapper program).

We greatly admire and support the basic initiative of your Committee in trying to establish and promote the use of remote-sensing satellite data. I appeared before your Committee repeatedly in the 1970's with testimony very similar in purpose to the objectives you are trying to accomplish with this legislation.

However, as desirous as we jointly are in bringing about these uses, some basic points have to be considered and accomodated--before this legislation can meet broad standards of congressional and judicial review and approval. Some of these principles override any valuable short-term objectives that this legislation tries to accomplish for remote sensing from space.

After thorough study of H.R. 4836 and being fully familiar with the principles that have guided United States Space policy ever since the Space Act of 1958 and President Eisenhower's "open skies" principles--insisting on and defending the unconditional "right to sense from space" and the "right to distribute" such data--and cognizant of the overriding constitutional principle of the freedom to gather publicly and privately whatever information one desires as part of the exercise of free speech, we respectfully recommend the following overriding addition to the purposes of H.R. 4836, with, if necessary, required changes in the rest of the language of that H.R. 4836:

> "Nothing in this Bill shall be construed to infringe in any form on the right of public and private persons to gather information at their expense from space for peaceful purposes; nor to infringe in any form on any property rights from information thus gathered; nor shall any license or other regulation be required for such activities; nor any direction be given by any Government entity as to the uses of such information; nor shall any public or private person be denied access to space transportation and other services provided by the U.S. Government or any U.S. person for the pursuit of such activities; nor shall such activities be denied or discouraged

when competing with whatever contractor(s) may be chosen by the Secretary of Commerce under authorization of this Bill."

We believe that this addition to H.R. 4836 is of critical, fundamental importance to the preservation of "open skies" principles in Space hitherto defended so assiduously by the United States for the benefit of all mankind.

In the following, we list some of the underlying considerations which underly our belief about why the suggested addition to the language of H.R. 4836 is of such overriding importance:

Ever since the inception of a civil remote sensing program by the United States in the mid-1960's, the ultimate goal of Federal remote sensing initiatives clearly was to see the commercial market take on these activities, in the United States and worldwide.

(1) Historical Considerations about Aerospace Commercialization

In this, the National Aeronautics and Space Administration followed the successful history of NACA (established in 1916) in the field of aeronautics and NASA's own science, research and technology initiatives under the Space Act of 1958.

By way of introduction and as as an important guide to the current decision at hand, it is useful to remember the past vagaries of fundamental Government sector v. private (commercial) sector decisions and activities in the United States in aerospace matters:

1.1 Airplane Monopoly Considerations by the U.S. Postal Service in the 1920's

One shudders to think what the history of U.S. commercial (civil) aviation would have been under the creation of a Government monopoly for all commercial aviation --a proposition seriously discussed and fortunately dismissed in the 1920's. Instead, the United States followed a commercial, private approach, which led to the creation of the most consistently successful sector of U.S. industry in terms of the net balance of trade contribution. NACA and NASA also have shown--in all of aerospace--the successful model of technology, innovation and commercialization, wherein the Government takes an active, early Research, Development, Testing and Evaluation (RDT&E) role, but leaves the commercial use and expansion of such technology to private companies and the marketplace.

1.2 Space Communications - Government (Military) Monopoly v. Commercial Approach

The other, and only, successful commercial space application sector to date--space commmunications--was faced with a similar, monumental decision in the early 1960's: the case was made that, indeed, space communications should be reserved for exclusive national security applications and, "second best" certainly preserved as a Government monopoly. The case for protecting national security considerations from "instantaneous" worldwide communications may have been strong, but the United States resisted such monopoly considerations at that time.

The United States then took the further step, in the early 1970's, of "deregulating" all U.S. domestic space communications. This step was openly resisted by some Government agencies and parts of industry.

The history of success since then belies the timidity and lack of faith in the integrity of free market forces. Today, "deregulation" of communications on a worldwide basis opens vast prospects for worldwide markets for U.S. technology and services--with access by U.S. companies to providing services in competition to presently existing monopolies in international space communications. The battle for "open skies" is being fought by the Department of Commerce through its very own NTIA.

Now the U.S. Government is faced with a related issue once again: of whether to take the plunge in commercializing remote sensing or to maintain and preserve a heavily subsidized, expensive Government service for civil remote sensing.

(2) Non-Discrimination Against Remote Sensing From Space

Any proposed legislation on licensing and regulating civil remote sensing from space seems to set a very disturbing and possibly unconstitutional precendent for licensing of all remote sensing activities, e.g. if remote sensing were licensed for space-based equipment, why not also for sensing from sounding rockets, aircraft (e.g. the Space Shuttle), or for television cameras on the ground and the open seas. Any licensing procedures for civil remote sensing seem to be in open violation of United States constitutional principles and

U.S. "open skies" space policy since 1958.

(3) Freedom of Information Principle Applied to Government Funded Information

Any information gathering activity sponsored and supported by the U.S. taxpayers ought to be available under current, well-understood principles of the public's right of access to such Government funded information (for Landsat anywhere from $2 to $4 billion--1983 dollars--for the past 18 years). One should not create a Government right to withhold civil information from some and not from others in any field. Nor should one introduce copyrights for such information, where such copyrights have been denied--rightly--by law for any Government held civil information. Nor should one resort to artificial institutional restrictions to avoid these issues. Hereunder Landsat information has been, is, and should continue to be available to the public under current rules, possibly with somewhat higher user charges to recover more of the taxpayers' funding.

(4) Maintain Full Property Rights to Privately Gathered Information

SPARX intends to fly two remote sensing missions a year during the development period (1984-1987) and four missions a year during full operations (1988-1997). This commitment by SPARX is possible as long as there is no infringement on the full property rights of SPARX to the data, information, know-how, technology, products and services founded on and derived from the SPARX-01 and subsequent missions. Of course, SPARX is and always intends to be in full compliance with any existing or future U.S. statutes and laws or international treaties to which the United States is a party.

In addition, SPARX agrees to stay within the generally talked about "ten meter pixel resolution" standard for civilian remote sensing missions from Space, althougn no such resolution standard exists today for remote sensing under U.S. law from the air, ground or open sea, including aircraft and sounding rockets.

Any further regulations, restrictions or understandings imposed on an enterprise carrying out remote sensing from Shuttle-based instruments when full payment of the Non-U.S. Government Space Shuttle user launch fee is made, which infringe in any form on the property rights of the enterprise--in particular to data gathered by a mission paid for by the enterprise--should be unacceptable to potential users of the Space Shuttle System, whether for remote sensing (domestic and worldwide), materials processing, communications or entirely new applications.

SPARX is aware of the concerns on the part of some concerning the full extension of the "open skies" policy, first announced by President Eisenhower in 1958, relative to commercial enterprise in Space which we now seek. We submit that these concerns are inappropriate and are typical of those who lack confidence in the dynamics of the world marketplace and in the great potential which commercial Space enterprise holds for the United States and other free market economies. We believe the United States should be first and foremost in the full defense of the "open skies" and free market principles in Space rather than submit to the fallacy--proven again and again in the history of economic enterprise--of protectionist and "regulatory thinking" in the form of rules imposed by central authorities who wish to maintain bureaucratic controls over free enterprise.

(5) Freedom to Gather Information and Freedom of Speech

The proposed licensing regulation procedures for civil remote sensing--say, by television cameras--set, in my opinion, an unconstitutional precedent on the right by anybody--however one sees fit--to gather, store and distribute information. Information privately paid for is, and should continue to be, the full property of whoever paid for such information. Any licensing, regulation or restriction by the United States on such civil information gathering would seem to be counter to every underlying U.S. policy in fields such as communications, press and speech (e.g. UNESCO issues, objectives of the National Telecommunications and Information Agency and of the Department of Commerce, etc.).

(6) "Open Skies" v. "Closed Skies"

The "open skies" policy has rightly been guiding U.S. space policy ever since it was first pronounced by President Eisenhower and complements other important ground and open sea principles.

SPARX believes that the very maintenance of the "open skies" principle--and the unconstrained right to sense from Space and to distribute such data however one desires--espoused by the United States so consistently since 1958, requires that the United States not change these principles for commercial remote sensing by adopting a "closed skies" policy which would require prior U.S. approval, regulation or licensing for launches on the Space Shuttle.

(7) Landsat Monopoly vs. "Open Market" Competition

In no way do we imply any prejudgment of any proposed Landsat data distribution policy, which we understand to contemplate continued government subsidization and required distribution at less than cost to all comers, possibly with no recovery of prior development or investment costs. We are not asking the U.S. Government to desist from any such or similar course on programs funded for so long by U.S. taxpayers (even though this could have a negative effect on any private remote sensing enterprise). We are only asking the U.S. Government not to infringe on rights of any commercial remote sensing mission that pays the Standard Non-U.S. Government User Charge.

Indeed, SPARX is looking forward to fully utilizing any past and continued U.S. Government subsidized Landsat data or any other available data.

However, SPARX believes the United States should not be artificially deprived of commercial remote sensing--from Space, the air or the ground--while the Government continues to provide essentially free information through Landsat.

To maintain Government civil remote sensing through continued Government subsidization is one thing; to prevent private competition in such activities by denying open access to commercial remote sensing missions by SPARX or anybody else is, we believe, unwarranted.

(8) The Ills of Government Protectionism

The issue, we believe, is not whether civil remote sensing can be "controlled" by the United States through regulating access to Space, but simply whether the worldwide community will make use of U.S. launch systems, technology and data processing or use those of competing, foreign nations and entities. Ill-advised protectionism by the United States at this time by attempting to control the distribution policy of civil remote sensing activities, would only do great economic harm to the United States in the late 1980's and 1990's. In this we believe NASA should learn from the negative lessons of attempted technology protectionism in Space matters during the 1970's, namely:

8.1 The denial by the United States Government of a European development of the Space Tug in the early 1970's as the European contribution to the full development of the U.S. Space Transportation System. Without such denial it is very likely that (a) no competing European launch system would exist today, (b) the United States would have at its disposal a reusable upper stage that could retrieve and deliver payloads to their designated orbits, constituting a full space transportation system out of the current Space Shuttle System; (c) the United States might have foregone the PAM-A, PAM-D, U.S. Shuttle Centaur and other interim non-solutions; and

8.2 The denial by the U.S. Government of the full commercialization of the Delta Launch Vehicle by the European Space Agency in French Guiana--which (in our opinion) led to the final ESA decision for the full European launch capability--and a $6 billion plus crder book for Arianespace.

In other words, the U.S. Government has created its own competition to the Space Shuttle System through "protectionist" decisions in the 1970's.

Looking forward to the 1990's, the United States, in our opinion, has two broad options:

(1) A full "open skies--free market" commitment by the United States in Space matters, which would lead to a substantially enlarged use by the worldwide community of a full range of Space services from the United States (rather than from other sources), be it in Space transportation, Space communications, Space remote sensing and materials processing; or

(2) A "closed skies--protected market" policy guided by technology and regulatory barriers in the supposed pursuit of U.S. interests, which will only add up to a gradual--and ultimately total--disenchantment of the international community with the use of U.S. Space technology services. Such a policy will also artificially stimulate the development of competing systems and technology which would not come about in an "open skies--open market" environment.

It is also our firm belief that a "closed skies" or "regulated skies" policy for civil remote sensing raises grave constitutional issues in that some government person(s) could unilaterally determine access to worldwide civil information gathering--something we understand is totally unacceptable to the United States policy with regard to the worldwide gathering, flow and publication of information.

Given the above considerations and the importance of the new opportunities we see in remote sensing in Space, we hope that a quick and early conclusion can be reached on a suitable policy on how to transition in the next three to four years to a truly commercial, "open skies", free civil remote sensing market. We are glad to extend any help we can offer in this regard. At the same time we also count on the full support of Government, including Congress, in seeing that such an open, commercial approach is adopted so that the United States can compete fully for such services in the late 1980's and 1990's.

Violating "open skies--free market" access now in civil remote sensing opens the door to further initiatives by other nations. It is a path the United States should avoid.

DR. KLAUS P. HEISS

Dr. Heiss is a nationally recognized authority on U.S. aerospace economics applications and commercialization issues. In the 1960's Dr. Heiss conducted major project evaluations of new technology systems for U.S. Government agencies, including the U.S. Atomic Energy Commission, the National Aeronautics and Space Administration, the U.S. Department of Transportation, the Office of Naval Research, and the Department of the Interior. Similar analyses were performed by him also for private industry and international organizations. Some of this work has had a major impact on policy decisions.

Innovations in economic analysis resulted from studies Dr. Heiss directed in the 1960's and 1970's. These include an extensive study of new Space Transportation Systems (Space Shuttle) for the 1980's, worldwide remote sensing of agricultural crops, and financial analyses of U.S. aerospace and defense industries. The General Accounting Office of the U.S. Congress as well as the Office of Management and Budget have extensively reviewed and used the findings of these studies.

The economic study of the space shuttle directed by Dr. Heiss (1970-1972) materially and importantly contributed to the space shuttle decision in 1972. Dr. Heiss testifed on several important technology programs in energy, transportation and strategic areas before the U.S. Congress (Senate, House). Dr. Heiss has been an economic adviser to the Office of Technology Assessment of the U.S. Congress (1974-1980), Chairman of the Economic Committee of AIAA (1976-1981), and an appointed member of various committees of the National Research Council, National Academy of Sciences.

Dr. Heiss is the Founder of ECON Incorporated (1973), an economic consulting group of about 50 people with headquarters in Princeton, New Jersey, and offices in San Jose, California; Houston, Texas; and Washington, D.C. Dr. Heiss specializes in the application of economic principles to social and technological issues.

In 1979 Dr. Heiss founded The Space Transportation Company Inc. (SpaceTran) and was its President and Chief Executive Officer. The purpose of SpaceTran was to bring about the private financing of Space Transportation System vehicles (orbiters). In October 1982 SpaceTran further undertook to commercialize the Titan launch system under a cooperative agreement with Martin Marietta Corporation, Chemical Systems Division of United Technologies Corporation, and Aeroject Liquid Rocket Company of the General Tire and Rubber Company. In the Spring of 1983, Federal Express assumed the commercialization, marketing, and SpaceTran name for Tital launch vehicles from SpaceTran.

Dr. Heiss currently serves as the Chairman of SPARX Corporation, a joint venture formed in fall of 1983 which is dedicated to the commercialization of space and the development of worldwide remote sensing applications.

AMERICAN
SOCIETY OF
PHOTOGRAMMETRY

210 Little Falls Street · Falls Church, Virginia 22046 Telephone: (703) 534-6617

March 2, 1984

RECEIVED

The Honorable Don Fuqua, Chairman
House Committee on Science and Technology
2321 Rayburn House Office Building
Washington, D. C. 20515

Re: Land Remote Sensing Commercialization Act of 1984 (H.R. 4836)

Dear Mr. Chairman:

The American Society of Photogrammetry (ASP) wishes to express its views on H.R. 4836, The Land Remote Sensing Commercialization Act of 1984. ASP has extreme interest in this bill in that our membership comprises the world's largest professional/scientific society devoted to the exchange of ideas and the dissemination of knowledge and new information about the application of the combined fields of photogrammetry and remote sensing. The society's 8,000 members come from across the spectrum of education, all levels of government, industry and professional practice. Hence, our group represents a cross-section of the country's remote sensing researchers, practitioners, and end users alike. In addition, ASP is affiliated with the American Congress on Surveying and Mapping, a professional society with 20,000 national and state members in the fields of surveying, mapping and geodesy.

Collectively, the members of our society have played a key role in developing the international leadership of the U.S. in civil remote sensing and in promoting its beneficial use in both the public and private sectors. It is from this broadly based technical involvement in the development and application of remote sensing that we wish to express deep concern over a central technical element of H.R. 4836. Specifically, we are concerned about this legislation establishing the data from the Multispectral Scanner "carried on the Landsat 4 and Landsat 5 satellites" as the minimum acceptable baseline for the quality of data upon which our national civil remote sensing program will be developed.

The Multispectral Scanner (MSS) onboard Landsats 4 and 5 is functionally identical to that flown previously on Landsats 1-3. Accordingly, while MSS technology initiated a new era in earth resource monitoring from space in 1972, experience has since shown the system to be inadequate in both its spectral and spatial resolution for a multitude of commercially significant applications. Being only a 4 spectral channel system (2 visible and 2 reflected infrared) with an 80 meter (80m) ground resolution, the MSS is now a technically antiquated system. Accordingly, we believe specification of a baseline functionally equivalent to MSS data is a mistake, irrespective of its being a minimum acceptable capability.

From the standpoint of the long-term commercial viability and scientific advancement of the program, our national civil remote sensing effort must encompass access to data at least functionally equivalent to the data from the Thematic Mapper (TM) flown on Landsata 4 and 5. This baseline would afford data collected in more numerous (7) spectral channels, which are more finely tuned, and which are more optimally distributed across the electromagnetic spectrum (3 visible, 3 reflected infrared, and 1 thermal channel). The practical implications of these spectral improvements are many and varied. They range from having a water penetrating channel important in the field of bathymetry, to being able to better monitor the condition of the world's crops and forests, to expediting the petroleum and mineral exploration process.

In addition to the above spectral improvements incorporated in TM data is the improvement of the data's spatial resolution. Whereas the MSS has an 80m ground resolution, the TM has a resolution of 30m. In that this parameter determines the degree of ground surface detail observable in the data stream, it is an extremely important sensor design feature from the standpoint of the range of potential applications of the data.

The attached illustrations are provided to underscore the importance of spatial resolution in the context of some familiar ground surface features. Attachment A shows schematically the comparative minimum area observable by the MSS (80m) and the TM (30m) in relation to the size of a football field. It is ground resolution elements of these sizes that are composited to form the images available from each of the respective systems. Clearly, one would expect a quantum jump in the information content of the TM imagery compared to that from the MSS.

Attachment B shows this to be the case. It depicts an MSS image of a portion of the Washington, D. C. area on the left and a simultaneously acquired TM image on the right. These images happen to be false color composites wherein vegetation appears in shades of red and pink; water appears as dark blue or black areas; and streets and buildings appear light blue or white in color. Note in the TM image the appearance of the Pentagon at A; Lincoln Memorial at B; reflecting pool at C; grass-covered ellipse at D; Washington Monument (and its shadow) at E; Jefferson Memorial at F; the Capital at G; Anacostia Bridge at H; Haines Point at I; and National Airport at J. Many of these features are virtually impossible to recognize on the MSS image.

The seven-fold difference in the minimum observable area in the TM data versus the MSS data is profound from a user's perspective. To the geologist, it may mean the difference between detecting or failing to detect a subtle change in rock structure during the exploration process. To the forester, it may mean being able to discriminate in detail between various types of merchantable timber, rather than simply between forested and non-forested areas. To the agriculturalist, it may mean the difference between observing the precise identity and condition of crops even in small fields, rather than simply discriminating broad agricultural types over large areas.

In short, many existing and prospective users will hope they can access data which exceeds TM standards. In this regard we must reiterate the fact that the French SPOT satellite, scheduled for launch next year, will supply 20m resolution data in a multispectral mode and 10m resolution data in a panchromatic mode. These data will be far superior to those from the TM.

A further technical point we wish to make is that with proper system design, remote sensing data can always be aggregated upward, but the reverse is not true. That is, we could acquire TM-like data and statistically sample it to generate MSS-like data for users requiring same. It would seem desirable to choose the system which would meet the needs of both extremes of the user community, thereby radically enlarging the size of the potential data market.

Given the above implications of the technical baseline on the scope of the data market; and, given the design of prospective competing foreign systems; and, given the need to maintain our technical lead in civil remote sensing if we are to have a commercially viable program; we believe that the language of H.R. 4836 should be amended to replace each and every reference to "Multispectral Scanner" with "Thematic Mapper" and replace "MSS data" with "TM data." Such a change would not be an insignificant alteration of a minimum technical requirement we all hope to exceed in the due course of the commercialization process. Rather, this change would signal to the world, from the legal inception of the commercialization process, that the U.S. is in the civil land remote sensing business to stay and it intends to keep its hard earned technical lead in the world marketplace.

We respectfully request that you consider our views in your deliberations and enter this letter in the record of the hearings on H.R. 4836.

Sincerely,

William G. Hemple

William G. Hemple
President

Attachments

cc: Members, Subcommittee on Space Science & Applications
Subcommittee on Natural Resources
Agriculture Research and Environment

Attachment A

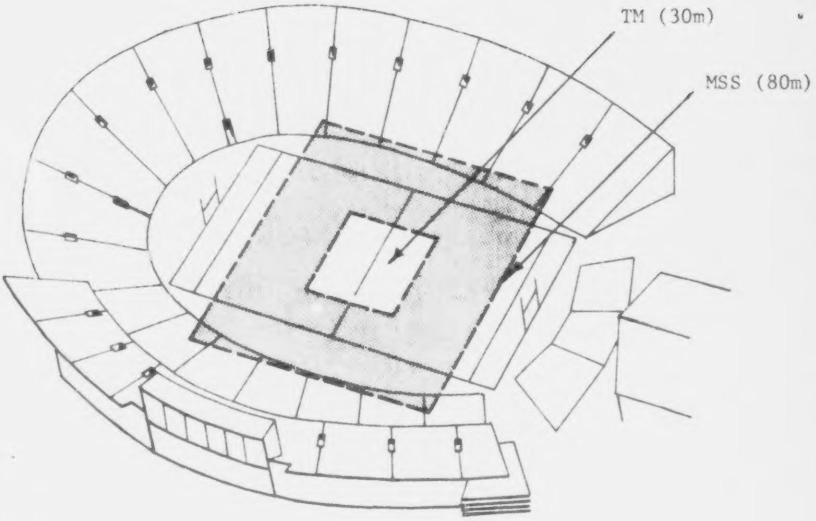
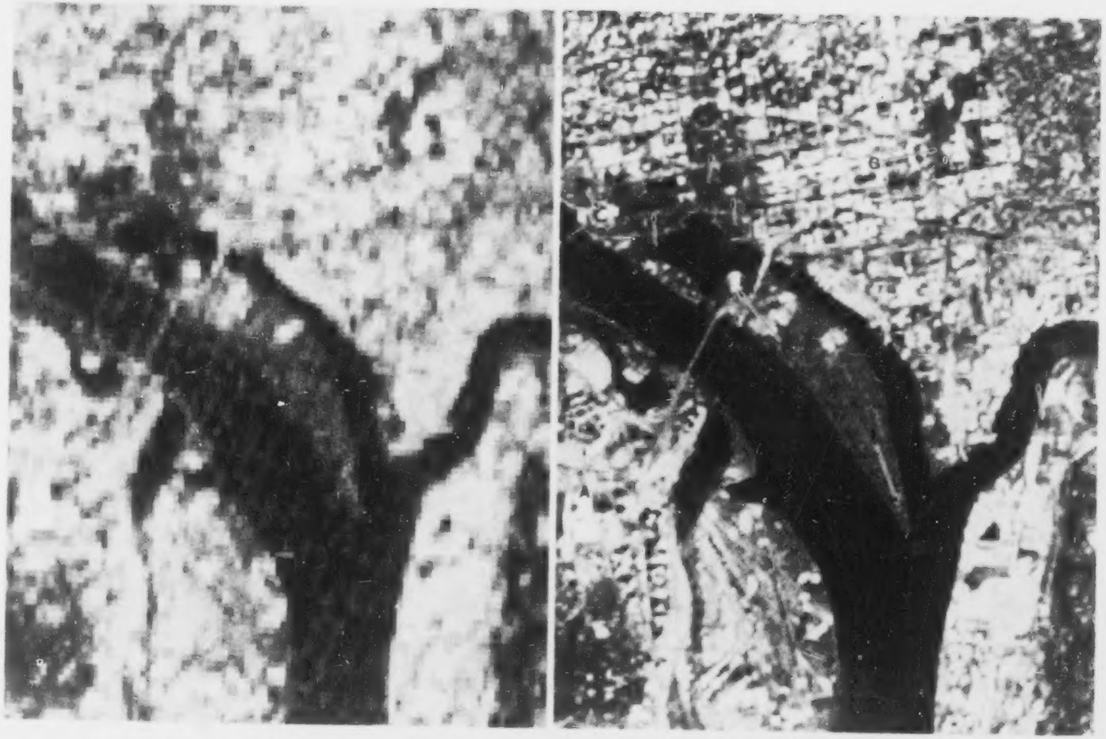

TM (30m)
MSS (80m)

Illustration 1. Resolution of Thematic Mapper (TM) vs. Multispectral Scanner (MSS).

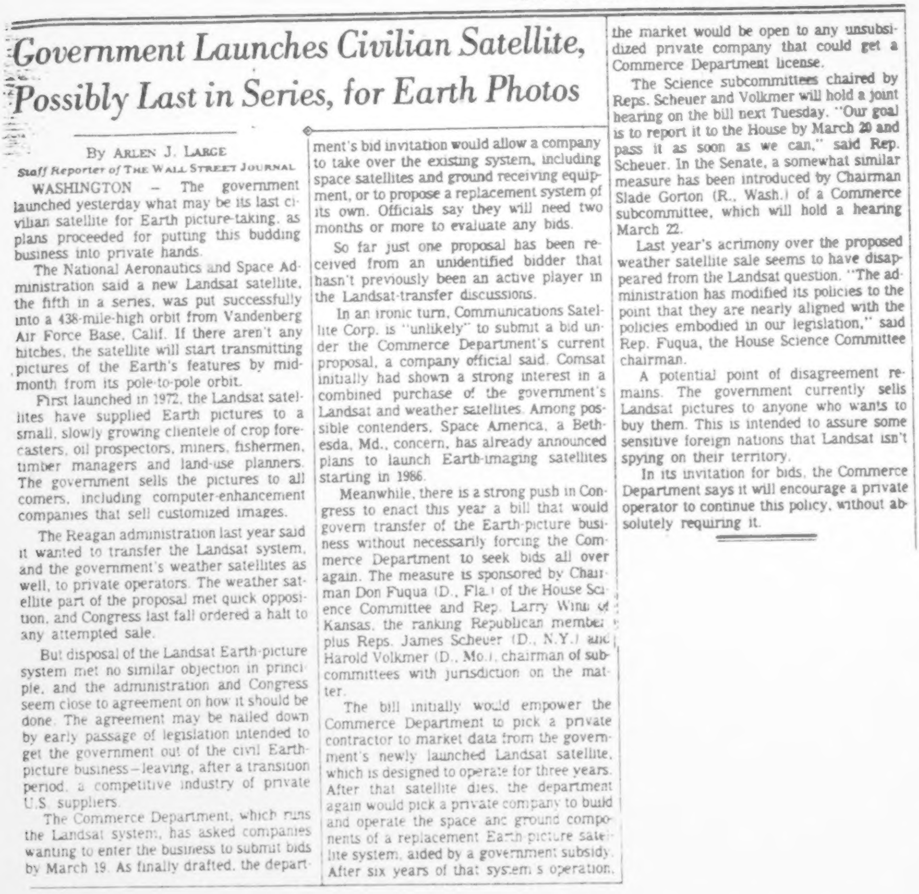
Attachment B



Simultaneously acquired Landsat 4 MSS imagery (left) and TM imagery of the Washington D.C. area, shown here in the form of simulated color infrared enhancements at a scale of approximately 1:50,000. Note the much greater spatial resolution of the TM imagery as evidenced by the appearance of the Pentagon at A; Lincoln Memorial at B; reflecting pool at C; grass-covered ellipse at D; Washington Monument at E (note its shadow); Jefferson Memorial at F; the Capitol at G; Anacostia Bridge at H; Hains Point at I; and National Airport at J. (Courtesy of NASA and the EROS Data Center.)

From: Manual of Remote Sensing, 2nd Edition
Copyright by the American Society of Photogrammetry

Wall Street Journal, P. 23, 3/2/84



Government Launches Civilian Satellite, Possibly Last in Series, for Earth Photos

By Arlen J. Large

Staff Reporter of The Wall Street Journal

WASHINGTON – The government launched yesterday what may be its last civilian satellite for Earth picture-taking, as plans proceeded for putting this budding business into private hands.

The National Aeronautics and Space Administration said a new Landsat satellite, the fifth in a series, was put successfully into a 438-mile-high orbit from Vandenberg Air Force Base, Calif. If there aren't any hitches, the satellite will start transmitting pictures of the Earth's features by mid-month from its pole-to-pole orbit.

First launched in 1972, the Landsat satellites have supplied Earth pictures to a small, slowly growing clientele of crop forecasters, oil prospectors, miners, fishermen, timber managers and land-use planners. The government sells the pictures to all comers, including computer-enhancement companies that sell customized images.

The Reagan administration last year said it wanted to transfer the Landsat system, and the government's weather satellites as well, to private operators. The weather satellite part of the proposal met quick opposition, and Congress last fall ordered a halt to any attempted sale.

But disposal of the Landsat Earth-picture system met no similar objection in principle, and the administration and Congress seem close to agreement on how it should be done. The agreement may be nailed down by early passage of legislation intended to get the government out of the civil Earth-picture business – leaving, after a transition period, a competitive industry of private U.S. suppliers.

The Commerce Department, which runs the Landsat system, has asked companies wanting to enter the business to submit bids by March 19. As finally drafted, the department's bid invitation would allow a company to take over the existing system, including space satellites and ground receiving equipment, or to propose a replacement system of its own. Officials say they will need two months or more to evaluate any bids.

So far just one proposal has been received from an unidentified bidder that hasn't previously been an active player in the Landsat-transfer discussions.

In an ironic turn, Communications Satellite Corp. is "unlikely" to submit a bid under the Commerce Department's current proposal, a company official said. Comsat initially had shown a strong interest in a combined purchase of the government's Landsat and weather satellites. Among possible contenders, Space America, a Bethesda, Md., concern, has already announced plans to launch Earth-imaging satellites starting in 1986.

Meanwhile, there is a strong push in Congress to enact this year a bill that would govern transfer of the Earth-picture business without necessarily forcing the Commerce Department to seek bids all over again. The measure is sponsored by Chairman Don Fuqua (D., Fla.) of the House Science Committee and Rep. Larry Winn of Kansas, the ranking Republican member, plus Reps. James Scheuer (D., N.Y.) and Harold Volkmer (D., Mo.), chairman of subcommittees with jurisdiction on the matter.

The bill initially would empower the Commerce Department to pick a private contractor to market data from the government's newly launched Landsat satellite, which is designed to operate for three years. After that satellite dies, the department again would pick a private company to build and operate the space and ground components of a replacement Earth-picture satellite system, aided by a government subsidy. After six years of that system's operation, the market would be open to any unsubsidized private company that could get a Commerce Department license.

The Science subcommittees chaired by Reps. Scheuer and Volkmer will hold a joint hearing on the bill next Tuesday. "Our goal is to report it to the House by March 20 and pass it as soon as we can," said Rep. Scheuer. In the Senate, a somewhat similar measure has been introduced by Chairman Slade Gorton (R., Wash.) of a Commerce subcommittee, which will hold a hearing March 22.

Last year's acrimony over the proposed weather satellite sale seems to have disappeared from the Landsat question. "The administration has modified its policies to the point that they are nearly aligned with the policies embodied in our legislation," said Rep. Fuqua, the House Science Committee chairman.

A potential point of disagreement remains. The government currently sells Landsat pictures to anyone who wants to buy them. This is intended to assure some sensitive foreign nations that Landsat isn't spying on their territory.

In its invitation for bids, the Commerce Department says it will encourage a private operator to continue this policy, without absolutely requiring it.

REMOTE SENSING AND THE PRIVATE SECTOR

ISSUES FOR DISCUSSION

A TECHNICAL MEMORANDUM

MARCH 1984

Technical Memoranda are issued by OTA on specific subjects analyzed in recent OTA reports or on projects presently in process at OTA. They are issued at the request of Members of Congress who are engaged in committee legislative actions which are expected to be resolved before OTA completes its assessment.

CONGRESS OF THE UNITED STATES
Office of Technology Assessment
Washington, D.C. 20510

Recommended Citation:
Remote Sensing and the Private Sector: Issues for Discussion—A Technical Memorandum (Washington, D.C.: U.S. Congress, Office of Technology Assessment, OTA-TM-ISC-20, March 1984).

Library of Congress Catalog Card Number 84-601019

For sale by the Superintendent of Documents
U.S. Government Printing Office, Washington, D.C. 20402

Preface

In March 1983, the administration proposed to transfer the meteorological and land remote-sensing (Landsat) satellite systems to private ownership. This proposal has raised a variety of issues, including concern over the small size of the market for remote-sensing data, the public good aspects of remote sensing, and use of the data to further foreign policy objectives.

In November 1983, Congress resolved one of the issues by deciding that the meteorological remote-sensing systems should not be privately owned; the Government will continue to operate them in the public interest. However, the Landsat system is still under active consideration by the Congress for transfer to private ownership, and Congress is now considering legislation designed to make such a transfer as smooth as possible.

U.S. systems have demonstrated to a variety of users, in the United States and abroad, that land remote sensing from space can be a powerful tool for mapping, assessing, and managing land resources. It may eventually be possible to establish a self-sustaining business selling data from a privately owned and operated land remote-sensing system to Government, private, and foreign customers. However, as the debate over whether and how to transfer the Landsat system has shown, the process of transferring Government-developed technological systems to the private sector is difficult and involves a wide variety of agencies and institutions, each with a different view of the appropriate means of transfer.

This technical memorandum, which was requested by the House Science and Technology Committee and the House Government Operations Committee, is designed to help Congress determine the appropriate requirements and conditions for private sector ownership of the U.S. land remote-sensing system. It also provides information and analysis that will be useful for Congress as it considers transfer legislation. This technical memorandum constitutes a portion of a major assessment of international cooperation and competition in civilian space activities that was requested by the House Science and Technology Committee and the Joint Economic Committee.

In undertaking this study, OTA sought the contributions of several Government agencies and a wide spectrum of knowledgeable and interested individuals. More than 50 persons contributed to this technical memorandum, either to provide data or to review early drafts. OTA gratefully acknowledges their help. We are particularly grateful to our workshop participants. Finally, OTA appreciates the assistance it received from the Congressional Research Service, the Department of Commerce, the Department of Defense, the Department of State, the Central Intelligence Agency, and especially from the National Aeronautics and Space Administration, and the National Oceanic and Atmospheric Administration.

John H. Gibbons

JOHN H. GIBBONS
Director

Chapter 1

Executive Summary

A process is now under way that is intended to lead to the early transfer from the Federal Government to the private sector of the Land Remote Sensing Satellite (Landsat) system for remote sensing from space. This technical memorandum was prepared at the request of the House Committee on Science and Technology and the House Committee on Government Operations, which are overseeing this process. The House Committee on Science and Technology is also simultaneously preparing implementing legislation.

This process inevitably raises the separable issues of whether to carry out the transfer at all, or how to carry it out if the Government does go ahead. This memorandum only indirectly addresses the question of whether the transfer is in the net public interest by focusing on **one aspect** of such a transfer: it discusses the various **public benefits** provided by the Government's civilian meteorological and land remote-sensing systems and analyzes the effects that transfer of these systems to the private sector might have on the provision of these public benefits.

Principal reasons for transferring remote-sensing services to private hands are that the private sector excels both at innovation and at developing markets. In an earlier study, OTA found a potential exists for greatly expanding the market for land remote-sensing services, and that other nations intend to compete for the market.[1]

Another reason for transferring these services to the private sector is the hope of reducing Federal expenditures. This technical memorandum bears directly on the question. Most of the public benefits which the United States now derives from remote sensing could be provided just as well by the private sector—for a price. However, OTA has found that a private owner/operator who was obliged by contract to provide all of these public benefits would probably require a large Federal subsidy. **Until the market expands substantially, and more efficient spacecraft are developed and deployed, it could cost the Federal Government as much to subsidize a private owner as to continue operating the system itself.**

The public benefits of land remote sensing *could* justify any of the following policy options:

- continued Government ownership and direction of the system, whether or not actual operation was contracted out; *or*
- maintenance of Government ownership for a limited period, in order to effect a phased transfer to the private sector, as the market grows large enough to support commercial ownership; *or*
- mixed, public-private ownership of the system; *or*
- quick transfer to a private owner/operator, but with a series of conditions and requirements designed to assure the public benefits; *and*
- a substantial subsidy to a private owner, in order to maintain the public benefits and maintain continuity of operation and data.

An understanding of the nature of the benefits is critical to an informed choice of policies. However, **this memorandum does not take the next step of comparing the value of the public benefits to alternative uses of the public resources required, nor does it address directly the relative merits of public and private ownership.**

Since this memorandum was requested, Congress passed appropriations bill H.R. 3222, a provision of which prohibits the sale or transfer of the meteorological satellite (metsat) systems to the private sector. On November 28, 1983, President Reagan signed this bill into law (Public Law 98-166). Because the issues raised by the administration's proposal may be important in considering the disposition of other Government-developed technologies, OTA has retained discussion of metsats in this technical memorandum.

The metsat and Landsat systems not only serve different, if related, functions and constituencies, but also differ sharply in their developmental history and current status. The metsat systems are fully operational and run by the Government as part of its responsibility to provide weather services. Provision of these services has a long domestic and international history and a set of usages and established procedures. The Landsat system, by contrast, has until recently been entirely a research and development (R&D) effort, although in many respects it has been used as if it were operational. Landsat data are also fundamentally different in format, repeatability, and continuity from other remotely sensed images, such as aircraft photography, and therefore have not had an easy market niche. The Landsat program as a whole is clearly ready to shift from the earlier emphasis on R&D toward provision of routine services. Moderate-resolution land remote-sensing technology* is ready for full operational status. The question Congress now faces is whether the United States should treat land remote sensing as a fully appropriate Government operational activity (as it has with metsat), or transfer it to private hands under a variety of conditions, or drop it completely.

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[1] *Civilian Space Policy and Applications* (Washington, D.C.: U.S. Congress, Office of Technology Assessment, OTA-STI-177, June 1982), pp. 53-67.

This technical memorandum outlines the tangible and intangible public benefits that flow from operational remote sensing managed in the public interest. It provides a basis for deciding which requirements and conditions a private offeror could be asked to meet if the Government proceeds with transfer of the land remote-sensing system. Further, this memorandum provides a summary of what public social, economic, and political losses could accrue if the Government decided to drop civilian land remote sensing altogether, and leave the field to the French, Japanese, Soviets, and others.

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*That is, the multispectral scanner or equivalent systems, whose spatial resolution is about 80 meters.

BACKGROUND

The potential value of viewing Earth's atmosphere, land, and oceans from space for civilian purposes was recognized early in this Nation's development of space technology. The United States launched its first civilian remote-sensing satellite (a polar-orbiting weather satellite called TIROS) in 1960. TIROS provided the first civilian images from space.

The National Oceanic and Atmospheric Administration (NOAA) currently operates two civilian meteorological satellite systems. One is a polar-orbiting system that consists of two satellites (NOAA-N series) orbiting the Earth once every 102 minutes; the other consists of two geosynchronous satellites (GOES) that view the Western Hemisphere continuously and transmit images to Earth every 30 minutes. Both systems carry a variety of relatively low-resolution sensors (1,000 meters (m) or more at the surface of the Earth), which operate at several wavelengths to provide weather imagery and related data.

In 1972, the National Aeronautics and Space Administration (NASA) launched the first of a series of civilian land remote-sensing satellites (Landsat). Among other experimental devices, the first three satellites carried a sensor called the multispectral scanner (MSS), having a terrestrial spatial resolution of 80 m and operating in four spectral bands. Landsat 4, launched in 1982, carries the MSS, as well as a new sensor called the thematic mapper (TM), which has a terrestrial resolution of 30 m and operates in seven spectral bands.* Transmissions from Landsat are received globally by 3 U.S. and 10 foreign-owned ground stations. Landsat 4 is currently failing and could stop working at any moment. Landsat D', which is the backup satellite for Landsat 4, is scheduled for launch in March 1984. Under current administration policy, this will be the last Government-owned land remote-sensing satellite unless new ones are ordered. NOAA now operates the Landsat system.

Although individual systems are typically designed to optimize the observations of the atmos-

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*Except for the 10.40 to 12.5 micron band which has a spatial resolution of 120 m.

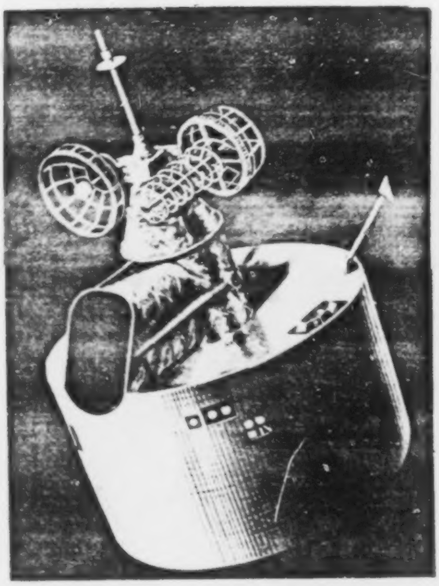

Photo credit: National Oceanic and Atmospheric Administration

Geostationary Operational Environmental Satellite (GOES series), artist's conception

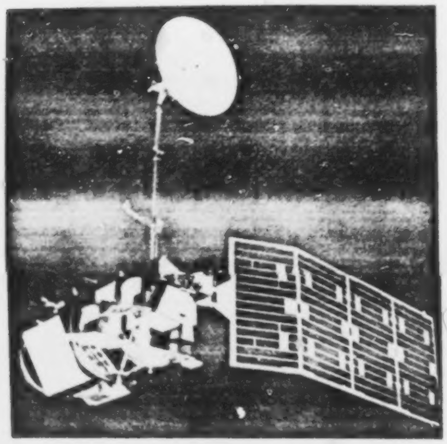

Photo credit: National Oceanic and Atmospheric Administration

Landsat 4, artist's conception

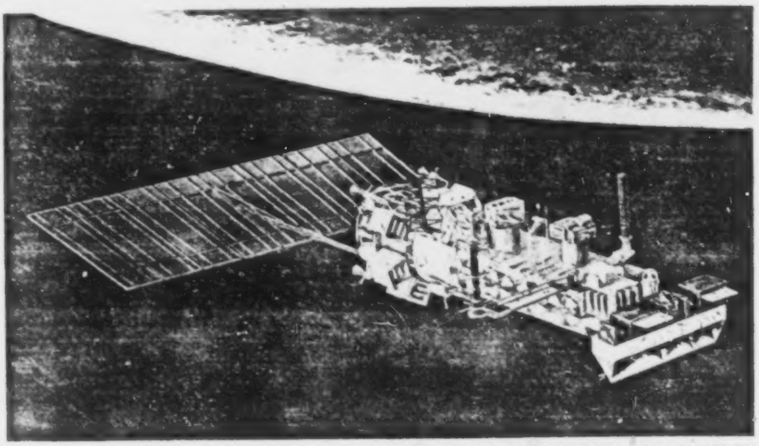

Photo credit: National Oceanic and Atmospheric Administration

NOAA-N series polar-orbiting environmental satellite, artist's conception phere, the land, or the oceans, sensors on board each satellite can also collect useful data on other components of the Earth. For example, agricultural managers use images from the meteorological satellites to estimate crop production, coastal-zone managers use Landsat data to study water pollution and pollution sources, and exploratory geologists use Seasat data to locate promising areas for exploration on land.

The Department of Defense (DOD) operates its own polar-orbiting meteorological satellite system. To a certain extent, DOD coordinates its meteorological operations with those of the civilian system. It makes use of data from the Landsat system, in addition to operating a system of surveillance satellites to serve national security needs.

Other countries are developing their own meteorological, land, and ocean remote-sensing systems. The European Space Agency (ESA), India, Japan, and the Soviet Union all currently operate meteorological satellite systems. The Soviet Union operates a land remote-sensing system; ESA and several other countries plan to launch land or ocean remote-sensing satellite systems by the end of the decade. Some of these systems will generate data directly competitive with data from the Landsat or related U.S. systems. By virtue of significantly higher resolution and a planned rapid delivery system, some will exceed Landsat's capacity to return useful data to users of remote-sensing data.

NASA's and NOAA's efforts with remote-sensing systems have demonstrated to domestic and foreign users, both inside and outside Government, that data from these systems can be highly effective in meeting their weather and resource information needs. In light of the potential commercial economic value that Earth resources remote-sensing data could have, the Carter administration, through Presidential Directive PD/54, directed that "Commerce will budget . . . to seek ways to enhance private sector opportunities" in land remote sensing. Although this directive left open the timetable and the means of a possible transfer of the Landsat system to the private sector, at the same time it committed the U.S. Government to provide a continuous flow of data from a land remote-sensing system through the 1980's. The Reagan administration decided early in its tenure to hasten the process of transfer; it further widened the scope of this policy by proposing that both the meteorological and land remote-sensing satellite systems be transferred to private ownership as soon as possible.

The Commerce Department set up a Source Evaluation Board (SEB) to draft the Request for Proposal (RFP) for transfer of the systems to the private sector. The RFP is intended to specify the Government's qualitative requirements for data for a period of time after transfer takes place, and to lay out the operational constraints that would be placed on the private offeror. The SEB issued a draft proposal for public comment on October 24, 1983. Prior to that time, it had solicited and received a number of comments from other Government agencies and from Congress. Commerce issued a revised RFP in January 1984 for industry's response. In keeping with the legislative prohibition on sale of the metsat systems, it no longer contains provisions for their transfer.

The RFP is long, technically thorough, and contains input from a wide variety of interested parties. In some respects, it is a very unusual RFP. For one thing, it leaves several important areas of Federal policy to be defined by the private sector. Further, in the absence of clear policy direction from either Congress or the administration, the private offeror runs an awkward and expensive risk of offering to invest and become involved in ways that could later be changed by policymaking legislation.

Congress held several hearings on the subject in 1983. The House and Senate are now considering legislation designed to encourage transfer of the Landsat system to private ownership reinforcing and specifically preventing similar transfer of metsats. Some members of both Houses favor transfer of the Landsat system; others feel it should remain a Government-owned and operated system.

INTERNATIONAL RELATIONS AND FOREIGN POLICY

Transfer of either system to the private sector would certainly affect our relationships with other nations. International issues related to transfer are among the most important and difficult to resolve satisfactorily. Consequently, the transfer proposal cannot possibly be approached as merely a domestic decision. Realistic planning for the disposition of the remote-sensing systems must address global concerns in the following areas:

International Relations and Foreign Policy Aims

Landsat and metsat data have served as useful and constructive instruments of U.S. foreign relations. These data have aided other countries to prepare in advance for severe weather conditions, and to map, manage, and exploit their own resources; they have also served to raise the general level of awareness about growing environmental problems throughout the world. The data from both systems, and the equipment with which to process them, have provided the United States with access to, and influence in, many other countries.

Although the private sector is technically capable (given adequate financial incentives) of providing the data promptly to meet the requirements of the Federal Government and other potential customers, commercial objectives may conflict with U.S. foreign policy objectives. Constraints on a private firm that are sufficient to protect U.S. foreign policy objectives could well make such an enterprise unprofitable or require a large and continuing Government subsidy to make the enterprise viable.

Data Sales

The United States has followed the policy, consistent with the practice of other countries, of providing meteorological data freely and without charge. After exploring the feasibility of charging for meteorological data, which raised ire and concern in other countries (especially those that participate in the data gathering), the administration decided to continue the earlier policy. If the metsats were to be transferred to the private sector, the Government would presumably purchase the data from the operating firm and then distribute them free of charge to other countries. Since the United States receives free of cost more vital meteorological data from other countries than it gives away, and since providing global weather data is a public good, maintenance of this data policy would continue to benefit the United States.

Landsat data have always been sold to non-U.S. Government users, and they have been made available to all purchasers on a nondiscriminatory basis. Indeed, the data policy of the Landsat program can be considered to be a cornerstone of the U.S. "open skies" policy and of the use of space for peaceful purposes. By following this policy, the United States has been able effectively to blunt criticism of other activities, such as the operation of classified surveillance satellites. It has also been able to demonstrate to the entire world its adherence to the principle of the free flow of information. It is a powerful message to send to all governments, especially those opposed to the open interchange of ideas and information, that Landsat data are available even to our political and economic adversaries at the same price and under the same terms as to our friends.

Yet, if the transfer to the private sector were made, potential owners would exert strong pressure to be allowed to set their own data sales policies in order to maximize profitability. Such a posture would frustrate the very policy the United States has fought so hard and so long to maintain in the United Nations and in its foreign relations. In view of the continued importance of the "open skies" principle to the United States, altering the principle of nondiscriminatory sale of land remote-sensing data would be harmful to many U.S. foreign policy interests, not just those involving outer space. Whether or not the Government decides to continue the nondiscriminatory policy, any charter for a private firm should be unambiguous with respect to the data distribution policies the firm could pursue.

Value-Added Services

To date, most of the revenue from the use of remote-sensing data has been earned by those corporations that process, analyze, add other information, and/or interpret the data for themselves or for others (the so-called value-added industry). The value-added companies constitute a small, but growing, specialized industry. Most bidders for a remote-sensing system would want to participate in the value-added business. **The primary economic value of the data from the meteorological satellites is in warning of impending severe or unusual weather. Since receiving terminals are relatively inexpensive, most countries and many organizations can afford to own and operate them. For meteorological data, allowing a data supplier to sell value-added services as well as data appears to raise no special concerns in developing countries as long as the raw data remain freely available to everyone with the capacity to receive them.**

High-resolution land remote-sensing data and the ability to analyze them are potentially powerful tools for resource development. Many developing countries have expressed the fear that if the company owning the data collection and distribution system were also allowed to offer value-added services, it might take special advantage of having control over the acquisition and distribution process to make its own value-added services more timely or more complete than the services of its competitors. Under such conditions, the company, and its most favored customers, could obtain economic leverage over countries that lacked the facilities and personnel capable of interpreting the data. **Therefore, from the standpoint of maintaining good relations with developing countries, it may be appropriate for the United States to restrict the private data distributor from entering into the value-added business, or to regulate it closely to prevent such a company from exerting unfair economic leverage over others.** As competition from foreign or even other domestic systems grew, it should be possible to relax such restrictions. Alternatively, the Government could require data analyses to be sold openly as well.

U.S. Technological Leadership

The existence of metsat ground stations, owned and operated by over 125 countries, and the much more expensive Landsat ground stations in 10 countries, constitute an eloquent statement of U.S. leadership in sucessfully applying high technology for the benefit of all mankind. The United States has also participated with both industrialized and developing countries in pursuing applied research in the uses of the data. **It is critical to the continuing R&D of remote-sensing technology and the growth of the data market for the United States to maintain its cooperative basic and applied research programs with other countries, both to advance U.S. research objectives and to retain U.S. leadership in the technology of outer space.**

Cooperation With Developing Countries

Through its international cooperative projects with developing countries, the United States has advanced the state of the art in remote sensing, and provided access to information and processes that those countries would not have been able to afford to develop unilaterally. This cooperative approach has materially helped such countries to cope with the enormous human and physical problems of resource management, especially in isolated, rural areas.

In an era of rising costs and decreasing budgets, it may be increasingly difficult for the Agency for International Development (AID) and other U.S. organizations to provide data and other research support in remote sensing, yet U.S. Government agency technical programs are largely responsible for the development of the international community of users of metsat and Landsat data, and the concomitant market for Landsat data products. **If the transfer to the private sector is made, it will therefore be important to assure that appropriate Government funding is continued for these projects, and that access to data will also continue.** It will also be important to involve private value-added companies in these projects.

International Legal Issues

The United States helped to formulate and is now party to four major international treaties and agreements that may affect the operations of privately owned Earth remote-sensing systems. Of greatest importance to potential private owners of remote-sensing satellite systems is the 1967 Outer Space Treaty, article VI of which requires "continuing supervision by the appropriate State party to the Treaty." At the least, this provision suggests some form of licensing and Government-imposed regulations for private space system operators.

In regulating a private land remote-sensing system, the Department of State, Department of Commerce, or other concerned Federal agencies have the opportunity to develop imaginative strategies and institutions for working with the private sector in this technology. The form of these strategies and institutions is particularly important because land remote-sensing data, by the nature of their information content, raise the sensitivities of other countries. **The Department of State's Bureau of Oceans and International Environmental and Scientific Affairs (OES), which would likely be charged with regulatory responsibility over international questions, would have to strengthen its technical expertise in space and its commitment to using space technology as part of the foreign policy of the United States. Such regulations could bring U.S. foreign policy objectives into direct conflict with the profit motives of private enterprise.**

Some countries maintain that they should have priority access to data derived from the sensing of their territory; others have argued that their consent should be obtained before these data are transferred to third parties. The United States maintains that a policy of free collection and dissemination of primary data is both supported legally and encouraged by the 1967 Outer Space Treaty and article 19 of the U.N. Universal Declaration of Human Rights.

Our historical policies of nondiscriminatory data sales and the free flow of information have served us well in deflecting attempts to restrict the right to sense other countries or to make those data available to third parties. Should transfer to private ownership result in discriminatory access to data—and a reduction in technical assistance and concessionary sales policies aimed at making these data less accessible to less developed countries—the U.S. position about "open skies" would have to be modified, with attendant losses to U.S. foreign policy objectives.

Future International Coordination

The United States currently participates in the deliberations of several international groups that set or coordinate standards for remote-sensing systems. If transfer of the Landsat system takes place, the Government should spell out clearly how private firms would interact with the Department of State and other U.S. agencies having cognizance over these matters.

Landsat Foreign Ground Stations

If the transfer takes place, the Memoranda of Understanding between NOAA and the foreign ground stations would become null and void. Yet the foreign ground stations provide data of significant importance to the U.S. Government. **In order for the private firm to supply the required data to the Government, in the absence of a system like the Tracking and Data Relay Satellite System, it may be essential for the firm to be able to enter into agreements with the foreign governments who own the receiving stations. Some countries may be unwilling to do so without major concessions regarding data distribution policy on the part of the private owner. In other words, foreign owners may insist on placing restrictions on sales of data to their adversaries.**

DOMESTIC PUBLIC GOODS

U.S. remote-sensing programs have contributed significantly to the domestic public welfare. The daily contributions of the meteorological satellites are visibly reflected in the daily media forecasts. Landsat's contribution is less often publicized, but the data it provides make possible new cost-effective ways to assess, manage, and exploit Earth's resources and environment. Landsat data are used for agriculture (to indicate crop stress and to forecast crop yield), forestry (to reveal the state and extent of forest resources and determine appropriate replanting strategies), resource exploration (nonrenewable resources), environmental monitoring and coastal zone management, cartography, and resource management.

State and Local Government

A fully integrated communications network for receiving and disseminating satellite meteorological data already exists in the U.S. National Weather Service, which adds these data to terrestrial observations and distributes them to the States and local communities in the form of long- and short-range weather forecasts. States and local news media use these data to warn citizens of impending weather conditions, including severe weather.

Several States have also begun to integrate Landsat data into their long-term planning, and to add them to computerized information retrieval systems. However, **the high cost of large computers and software and the expense of training and maintaining personnel, combined with uncertainties about Federal policy, are inhibiting the States from relying more heavily on Landsat data.** Further, some States that now use Landsat data to support their planning efforts are worried that transfer of the system to private hands would cause sharp rises in the prices of data over a short time. In order to cut costs, many States share Landsat data purchased from the Government with other States, particularly in border areas where Landsat scenes cover land in two or more States.* **States express concern that private owners would copyright the data in order to inhibit copying and trading them, which would also raise the costs of using Landsat data.**

Continuing Research

Important for satellite remote sensing is research on how to apply the data to environmental and resource problems as well as on improving sensors and related hardware. Although meteorological satellites have been operational for years, experimenters continue to discover ways to use their low-resolution data to solve some resource problems. For example, these data now serve as important adjuncts to the use of Landsat data for agricultural predictions. **It will be important to continue university, private sector, and Government research on applying meteorological data to resource problems. In addition, there is a need for continuing improvements to the meteorological sensors. The present research program within NOAA is inadequate.**

Although the system to produce data from the MSS sensor aboard Landsat 4 is appropriately termed "operational," many of the techniques to use the data effectively are by no means well understood. **Thematic mapper (TM) data will require considerable experimentation in order to learn how to make the best possible use of them. The universities could play a strong role in such research. Without a continuing source of data and continued experimentation in the public and private sectors with applying both MSS and TM data, the market for data and data products will** not develop and potential benefits will remain unexploited by the United States.

NASA plans to fly a variety of advanced experimental remote sensors on the space shuttle. However, there is also a great need to develop long-life operational sensors and associated processing hardware that can be used for commercial purposes. **Smooth incorporation of new hardware into operational systems generally mandates evolutionary, not revolutionary, changes in design and system capacity.**

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*Sharing data by copying data tapes or photographic products is now a common practice in Federal agencies, private industry, and the universities, as well as in State and local government.

Maintenance of Archives

Data gathered from meteorological satellite observations contribute to our knowledge of long-term weather patterns. In particular, the National Climate Program within NOAA assembles these data and combines them with other satellite and terrestrial data to produce world climate models. **In order to continue the research on weather and climate, it will be important to continue to archive meteorological satellite data and to maintain continuity of the data format.**

The EROS Data Center (EDC) currently maintains an archive containing most of the data it receives. However, most foreign data are not included in the archive, nor is it possible to purchase most foreign data directly from EDC. Customers must generally purchase their images of foreign land areas from the appropriate foreign ground stations. The expense of maintaining a complete archive of all the data ever received from the Landsat system is too great. However, it should be possible to construct a complete set of cloud-free images of MSS data for the entire world. To date, because of lack of funds, this has not been done, although NOAA and NASA recognize the value of such an archive, especially for mapping, land-use planning, and for mineral exploration. **The Government would have to decide whether the limited archive maintained at EDC would be transferred to the private sector and, if so, under what conditions. If the archive is transferred, safeguards to protect it from later deterioration or destruction should be instituted so that all interested parties will continue to have access to these data without copyright restrictions.**

University Programs

In addition to their role of developing and instructing in the use of new technologies, universities and other not-for-profit organizations have carried out research in using Landsat data for themselves, State and local governments, private industry, and the Federal Government. At present they face two major concerns: 1) the steeply rising prices of Landsat data and the concomitant decrease of Federal research support have caused some universities to reduce severely their research and teaching programs; and 2) the universities express worries that both the operational and research aspects of the U.S. Landsat program lack direction. **From the point of view of university researchers and teachers, these uncertainties make the prospects for the future grim, presaging further reductions in their teaching and research programs related to land remote sensing. Yet these institutions play a major role in technology transfer,** both in the United States and abroad.

CIVILIAN FEDERAL GOVERNMENT REQUIREMENTS

Data from the meteorological satellites have been used directly by the various Federal mission agencies either as they are transmitted to Earth, or after being processed and integrated with other weather data by the National Weather Service. If the process of transfer of the metsats to private ownership had continued, the Government would have offered to control, and pay for, the provision of required domestic and international meteorological data. It would have left to the private sector the design and operation of future satellites, sensors, and related equipment to ensure that the Government's needs for data were met.

For several years, data products derived from the Landsat MSS sensor have been applied by the mission agencies to specific resource management and evaluation tasks. In most cases, these data products have become the standard for the remote-sensing users, both within and without the Government. Although TM data will continue to be used for research purposes, **because of the difficulties and expense of processing the enormous volume of data represented in a TM scene, they will see relatively limited use. MSS-type data will continue to be of general interest to large parts of the user community for some time to come.**

In part this interest exists because the user community is accustomed to using the data, but for many users, the data's four-band multispectral characteristics and synoptic view are often of greater importance than their spatial resolution. **Although it will be important to continue to study the applicability of advanced data such as TM, which incorporates seven spectral bands, for Federal mission agencies, data equivalent to MSS in format, spectral and spatial characteristics will satisfy most civilian Federal needs for the rest of the 1980's.**

Even if the private sector assumes responsibility for providing remote-sensing data for the U.S. Government, it will be necessary for the Government to maintain oversight authority over such corporations to assure that they continue to provide Federal data needs. **It seems appropriate to designate a single lead agency to supervise and regulate all U.S. civilian remote-sensing activities. However, to protect both Government and private interests, it will be necessary that the agency act in such a way as not to stifle realistic opportunities for a private owner to exercise initiative and flexibility in providing data responsive to a worldwide market, including the private U.S. market.**

Government Data Requirements

If transfer of the Landsat system to private ownership were made soon, (i.e., while Landsat 5 is still functional[*]), it would be appropriate for the new owner to maintain data products and service equivalent to, or better than, the Government now provides using the MSS sensor. However, one of the reasons for transferring the system to private hands would be to achieve better data products, delivery, and services than now exist. **Thus, as the privately owned system evolved, the Government would be likely to demand improved service and products.**

As U.S. private satellites begin to incorporate improved sensors capable of higher resolution and pointing, as the French SPOT satellite has been designed to do, it will be tempting for the Government as well as other customers to ask the corporation to respond to special data needs, in addition to supplying routine data. However, such special tasking can only be accomplished at an extra cost, because it takes the satellite away from routine tasks. Because this differential pricing (for differing levels of service) also has the potential for being discriminatory, it should receive careful consideration and rules for handling it should be developed.

Alternative Systems

The Landsat system provides a unique capacity. No other technique in the world provides the ability to obtain reasonably detailed data (i.e., each minimum unit of Landsat MSS data represents 1.1 acres on the ground), over the entire Earth, and at a repetitive frequency that allows most temporal changes to be monitored effectively. However, in order to derive the maximum user benefits of this technology, it will be necessary to find ways to reduce sharply the system costs while improving delivery. **System studies by several private companies have shown it may be possible to achieve cost reductions of up to 50 percent for an operational system. If the Government decides to maintain its own civilian land remote-sensing system, it will be essential to find additional ways to reduce system costs. Because R&D is so expensive, major cost cutting for operational services implies that substantial R&D can no longer be done while providing a high level of routine services.**

NATIONAL SECURITY REQUIREMENTS

The ability of the United States to collect extraterritorial information of military and intelligence value was suddenly and dramatically improved in the early 1960's with the development and operation of classified meteorological and reconnaissance satellite systems by DOD. Satellite programs provide, among other things, essential data about areas of the world where other types of U.S.

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[*] Landsat 5 will be called Landsat D' until it is launched and operating in March 1984. Its nominal lifetime in orbit is 3 years for the spacecraft, 3 years for the MSS, and 1 year for the TM.

access is restricted. So long as both the civilian unclassified programs and the military classified programs are under the direct control of the Federal Government, the activities of both can be coordinated and controlled in the national interest. **However, placing remote-sensing programs in the private sector may make it very difficult to continue appropriate coordination between systems and control over data delivery.**

It is little appreciated that the intelligence and defense communities, taken together, currently are the largest users of Landsat data within the Federal Government. If there were no appropriate civilian Government system or sufficient safeguards on a privately owned system, these communities might find it necessary to build and operate their own system, thereby diminishing any expected budget savings.

DOD Oversight of Technical Specifications

NASA, in collaboration with other Federal agencies, academic institutions, and industry, has carried out a substantial program of experimentation and demonstration of sensors and data-processing techniques for land remote sensing. NASA has pursued its research in cooperation with DOD as provided for in the 1958 National Aeronautics and Space (NAS) Act. Until recently, the ground resolution of the civilian systems has not been sufficient to detect objects of significant military interest. However, **the development of advanced high spectral and spatial resolution civilian sensors in the United States and abroad, and the prospect of private sector entry into the realm of land remote sensing, necessitate a reexamination of U.S. and other national policies regarding technology development and technology transfer. Areas that should be examined carefully include the limits that should be placed on the ground resolution of space-borne sensors, their spectral characteristics, and on sophisticated data-processing techniques. However, in the face of the development of advanced foreign systems, it will be difficult for DOD to exert much control over advances in U.S. civilian hardware and processing techniques without making it impossible for the United States or its firms to compete in the world market.**

Preemption by the Military in Time of Emergency

The increased spectral and spatial resolution of TM or other land remote-sensing systems make the data they provide of increasing interest to DOD and the intelligence community. These data could serve as a supplement to other data collection means at any time. **It will be essential to spell out clearly the particular requirements of DOD and the intelligence community for hardening of the system's electronics, and the system specifications, as well as the conditions under which the private system could be preempted. Meeting these special requirements will add cost. If the private owner were to be required to meet them without specific compensation, data prices would be extremely high for all users, which would inhibit the development of a commercial market for data. If the Government were to pay for these additional capabilities, such support would constitute an additional subsidy of the system, beyond the basic ones of no competition and fixed data purchases.**

FOREIGN COMPETITION

It is clear that other countries, building on the experience gained from U.S. applications technology as well as on their own capabilities, see the development of meteorological, land, or ocean remote-sensing satellites as an integral component of their entry into space. In addition to constructing systems competitive with the U.S. Landsat system, they are also moving to develop systems that will sense the physical parameters of the oceans and the coastal waters. The United States, though it has a program within NASA to develop new sensors to fly intermittently on the shuttle, has no plans to develop civilian operational systems for land or ocean remote sensing that would provide continuous data over the long term with repeat coverage.

In order to maintain U.S. leadership in applications of space technology, it will be important for the United States to maintain continuity of data delivery. This is likely to require Government subsidy. It will also be important for the Government and the private sector to sustain a vigorous program of research in both space systems and the applications of the data such systems supply to the solution of a wide range of terrestrial problems. If the United States wishes to maintain leadership in this technology, it will be essential that the technology and the data it produces, whether publicly or privately owned, remain an integral component of U.S. domestic and foreign policy.

REPORT BY THE

Comptroller General

OF THE UNITED STATES

Effects On Users Of Commercializing Landsat And The Weather Satellites

In March 1983, the administration proposed to transfer the National Oceanic and Atmospheric Administration's satellites--a land-observing satellite, called Landsat, and the weather satellites--to the private sector. This report discusses how these satellites are used worldwide and how their commercial operation might affect users.

In November 1983, the Congress enacted legislation to prevent the sale of the weather satellites; the administration is proceeding with its efforts to commercialize Landsat. In considering legislation to authorize a sale, the Congress should consider whether the sales terms proposed by the administration adequately protect the interests of Landsat users in the United States and abroad.

UNITED STATES GENERAL ACCOUNTING OFFICE

GAO/RCED-84-93
FEBRUARY 24, 1984

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-214057

The Honorable Jack Brooks
Chairman, Subcommittee on Legislation
and National Security
Committee on Government Operations
House of Representatives

The Honorable Charles McC. Mathias
United States Senate

The Honorable John C. Stennis
United States Senate

The Honorable Edward Zorinsky
United States Senate

This report discusses how the National Oceanic and Atmospheric Administration's remote sensing satellites--Landsat and the weather satellites--are used by federal agencies, other U.S. organizations, and foreign governments and how users might be affected by the commercialization of these satellites. It also outlines issues regarding the commercialization of Landsat for consideration by the Congress as it takes up legislation to authorize its sale. As requested by your offices, the report presents the information we developed on the weather satellites, even though their sale has been prevented by recent congressional action. Our classified report to you entitled National Security Implications of Commercializing Landsat and Weather Satellites (GAO/C-RCED-84-1, Feb. 1, 1984) discusses commercialization in relation to national security issues.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of the report. At that time we will send copies to the appropriate House and Senate committees, the heads of departments and agencies whose programs we discuss, Members of Congress, and other interested parties.

Milton J. Socolar

Acting Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT

EFFECTS ON USERS OF COMMERCIALIZING
LANDSAT AND THE WEATHER SATELLITES

DIGEST

The Department of Commerce's National Oceanic and Atmospheric Administration operates two remote sensing satellite systems--the weather satellites and Landsat--which produce data with worldwide uses. In March 1983, the administration announced its decision to transfer these satellites to private enterprise and rely on the private sector in the future for the data these systems supply. The administration wants to commercialize Landsat because it believes that the private sector can develop a market for Landsat data better than the federal government and can help the United States retain its international lead in this technology. Inasmuch as the Landsat activities are not presently economically self-sustaining, commercialization of the weather satellites was proposed so the private satellite owner would be assured of a source of revenue while the Landsat market was being developed.

The Chairman, Subcommittee on Legislation and National Security, House Committee on Government Operations, and Senators Mathias, Stennis, and Zorinsky, asked GAO to examine several aspects of the proposed sale, including

--its effect on the national security of the United States,

--the uses which federal agencies have or expect to have for satellite data,

--the effect of the sale on nonfederal United States and foreign government users, and

--conditions which could be included in the contract transferring the satellites to the private sector.

The national security aspects of the proposed sale are discussed in GAO's classified report entitled National Security Implications of Commercializing Landsat and Weather Satellites (GAO/C-RCED-84-1, Feb. 1, 1984). Recent congressional action has prevented the sale of the weather satellites, but the information GAO developed on these satellites is included in this report at the request of the Members of Congress who asked for the GAO review. (See pp. 3 to 5, and 27 to 42.)

LANDSAT USES

Since 1972, the United States has maintained in orbit a series of land sensing satellites called Landsats. The current Landsat is the fourth in the series. Landsat "senses" the earth's surface and sends the data back to earth in a form which can be processed into photographic images or computer-compatible tapes. Landsat data are used around the world to estimate and manage crop production; explore for minerals, including petroleum; make and revise maps; and accomplish other purposes. Landsat data are used in the United States by federal and state agencies, industrial and service businesses, and universities. Landsat is also used extensively by foreign governments which operate 10 ground stations to pick up Landsat signals. The federal government had spent, through March 1983, about $477 million to build, launch; and operate Landsat 4; to build a satellite to succeed Landsat 4; and for the Landsat ground system. The U.S. government charges Landsat users a fee designed to recover operating costs, but not building or launching costs. (See pp. 2 and 3.)

USER CONCERNS RAISED BY THE PROPOSAL TO COMMERCIALIZE LANDSAT

A change from government to commercial operation of Landsat could mean major changes for Landsat users. GAO discussed these possibilities with a sample of users, including representatives of 18 federal agencies, 16 other U.S. users, and 10 foreign countries. The views GAO obtained on commercialization were those of organization officials and may not represent the formal position of the organizations themselves. (See pp. 7 and 8.)

Federal and nonfederal domestic users of Landsat believed the present limited market for Landsat would not allow a private operator to make a profit at current prices. They were concerned that with monopolistic control over the supply of data, a private operator could increase prices and also reduce data quality. Both federal and nonfederal users believed that a commercial operator would not perform sufficient research and development. (See pp. 11 and 12, and 23 to 25.)

Representatives of several nonfederal users recommended that commercialization of Landsat proceed in stages beginning with data distribution. These users said that a gradual turnover of the system to the private sector would improve the chance for successful commercial operation by allowing time for development of a profitable market. (See p. 25.)

Private companies which buy Landsat data from the government for analysis and resale--termed "value-added" companies--were concerned that a private operator would use its control over the source of data to drive them out of business. (See p. 23.)

Under federal operation, Landsat data have been broadcast directly from satellites to receiving stations operated by foreign governments. The United States has followed an equal access data distribution policy, making Landsat data available to all interested parties, including the country from which the data were sensed, at the same time and on the same terms.

Foreign governments were concerned that commercial operation of Landsat might change these data distribution arrangements. They were concerned that a private operator might, for commercial reasons, stop transmitting data to their ground stations--very often facilities in which they had invested considerable resources--or that the operator would increase prices to the point that they could no longer afford the data. Also, the foreign governments said that a private company might find it profitable to sell, for the exclusive use of outsiders, information on their countries' resources or activities, which would be harmful to their economic or national security interests. (See pp. 17 to 19.)

Although most federal and other U.S. Landsat users believed that commercialization could affect them adversely, some believed that private control of the satellites would help improve service and increase marketing of data. (See pp. 9 and 23.)

HOW THE REQUEST FOR PROPOSALS ADDRESSES USER CONCERNS

Following the March 1983 announcement of the administration's decision to commercialize the satellites, the Department of Commerce set up a Source Evaluation Board to prepare requests for proposals. Requests for proposals were drafted for both Landsat and the weather satellites, but because the Congress enacted legislation in November 1983 to prohibit the sale of the weather satellites, only the Landsat request was issued. Responses to this request for proposals are due at the end of February 1984.

The Landsat request for proposals requires offerors to describe the type of land remote sensing system they would build to replace the current system and the operating and pricing policies they would follow. It also indicates that the government is willing to provide financial assistance to a private operator and invites offerors to state what form of financial assistance they would prefer. According to Source Evaluation Board officials, financial assistance is being considered because the current market for Landsat data is not strong enough to support a profitable operation. (See pp. 5 to 7.)

Complete information on the operating characteristics of a commercial land sensing system and the associated costs will not be known until a contract is agreed upon by the government and a private operator. However, the request for proposals does address many of the concerns raised by federal Landsat users. For example, the request for proposals requires a private operator to orbit a sensor which provides data at least equal to the current Landsat operational sensor. In addition, a prospective operator must describe methods for improving data coverage and timeliness and for ensuring that data quality is maintained. The request for proposals also states that the government plans to continue land remote sensing research and development.

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However, the request for proposals satisfies fewer of the concerns raised by international and nonfederal Landsat users. For example, subject to U.S. government approval, the private operator could terminate broadcasts to foreign ground stations and change the present federal data distribution policy by refusing to sell data to a country from which the data were sensed. A private operator might find these changes commercially advantageous. The request for proposals does not describe the criteria that the federal government would apply to requests by a private operator for these changes. But because Landsat will be a commercial venture, economic considerations may influence government policymaking to a greater extent than in the past. The private operator would also be permitted to enter the value-added industry. According to Source Evaluation Board officials, the request for proposals does not impose all the restrictions on a commercial operator that international and nonfederal U.S. users want, because the request is designed to encourage full commercial development of a land remote sensing system with a minimum of federal regulation. (See pp. 12, 13, 19, 20, and 25.)

MATTERS FOR CONSIDERATION BY THE CONGRESS

The administration plans to propose legislation to the Congress to authorize commercialization. The Congress may set out in this legislation requirements for commercial operation in addition to or different from those contained in the request for proposals.

In deliberating on this legislation, the Congress may wish to consider the following:

--Should a private Landsat operator be required, under terms and time frames specified by the Congress, to continue present arrangements for broadcasting data to foreign ground stations?

--Should a private operator be required to continue the traditional U.S. government policy of providing a sensed country with equal access to data obtained on its territories and activities?

--Should protection be provided to firms in the value-added business so that they can compete with the private Landsat operator? For example, the Landsat operator could be required to make data available to all value-added firms on the same terms and as soon as the data are ready for analysis by the operator itself.

--Should a step-by-step approach to commercialization, beginning with data distribution, be an alternative to control of the whole system. (See pp. 20, 25, and 26.)

Any legislation authorizing the commercialization of Landsat must balance the financial interests of the private operator against the concerns of Landsat users that unregulated commercial operations will adversely affect their interests. Potential private operators will in turn consider whether legislatively or administratively established terms and conditions make private Landsat operation economically attractive.

HOW THE CANCELLED PLAN TO COMMERCIALIZE THE WEATHER SATELLITES WOULD HAVE AFFECTED USERS

GAO discussed the proposed plan to commercialize the weather satellites, now cancelled because of congressional action, with officials of 7 federal agencies, 14 other U.S. users, and 11 foreign countries which use U.S. weather satellite data. Federal and domestic nonfederal weather satellite users wanted to avoid higher charges for weather data they now receive free or at low cost. They also wanted the current level of data and services to be maintained. Private companies that did value-added work on weather satellite data believed that entry of a private operator into their business would jeopardize their existence. Foreign users of weather satellites were concerned about charges for satellite data previously provided at no cost through programs such as the United Nations' weather information exchange system.

Although most federal and other U.S. satellite users said that commercialization could affect them adversely, some believed that private control of the satellites could help improve service and data marketing.

The unissued weather satellites request for proposals sought to ensure that, for the most part, commercial operation of weather satellites would not affect current users. The private operator would have been required to continue present services and supply the U.S. government with data and services to continue present international meteorological cooperation. Users of the weather satellite communications services, however, might have faced price increases and the private operator would have been allowed to enter the value-added business. (See pp. 27 to 42.)

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